NUMBER 2

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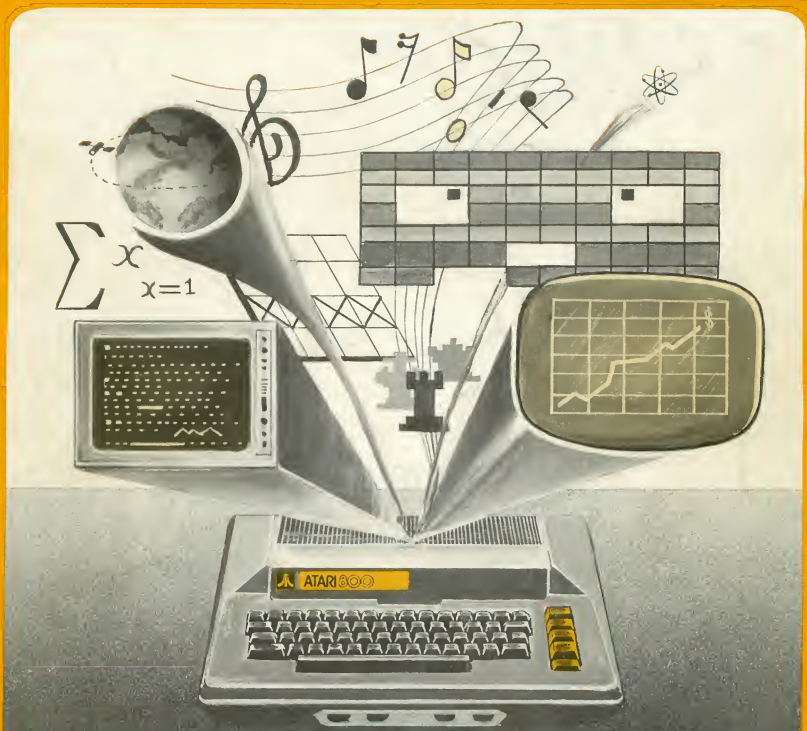
A.N.A.L.O.G. 400/800 MAGAZINE

ATARI NEWSLETTER AND LOTS OF GAMES

MARCH/APRIL 1981



Atari Printer Reviews .... Disk Files: using Note & Point

Balance your Checkbook ..... Download Terminal!

NEW PRODUCTS..... RUMORS..... VCS UPDATE

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A.N.A.L.O.G. 400/800 MAGAZINE

ATARI NEWSLETTER AND LOTS OF GAMES

MARCH/APRIL 1981

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EDITORIAL

WHAT WILL A.N.A.L.O.G. BE LIKE?

by Mike DesChenes

Welcome back! With this second issue of A.N.A.L.O.G., we begin our search for an identity. Tell you what — first I'll tell you what we would like to see in A.N.A.L.O.G. and then you can tell us what you want. Actually we're mostly interested in what you want, but we don't know what that is until you respond.

We've been receiving quite a bit of mail from you already. And from the looks of it, our audience includes some very talented lay people as well as many of you who are new to the world of computers. And let me say that choosing the Atari was your best move. Some of your comments appear in the "Reader Comment" section. We also hope that our advertisers have responded to your requests for information on their products. (If not let us know.) I would also like to extend a special thanks to the hundreds of you who answered our questionnaire. Your willingness to take the time to tell us about yourselves and your Atari will be very valuable to us in planning our publication.

Our premiere issue of A.N.A.L.O.G. was very well received by most of our readers (not bad for our first attempt). However, a few Atari dealers felt as though they were at a disadvantage because of our position as an Atari users magazine. They feel as though we are taking advantage of our publication by placing ads for Atari products. So in order for us to satisfy everyone involved, we have decided not to use our magazine to this advantage. We will however advertise third party software. This decision has helped us with the answer to the above question: What will A.N.A.L.O.G. be like? We would like you to know us as a support magazine with a mixture of software and hardware reviews, tutorials, program listings, and general information on the Atari.

A.N.A.L.O.G. will be different in many respects. For one thing, we're alone in offering a large number of comprehensive reviews for the Atari system. We believe that if you own or are planning to own an Atari, you need and want a large number of program reviews. If you're in the market for a particular piece of software or hardware, you can be sure that the most authoritative reviews will appear in these pages. You'll also notice that in future issues, we will no longer accept advertisements from retail stores or mail order companys who sell the Atari line of computers and accessories. As a source magazine we will only accept ads from third party companys who produce top of the line software and accessories for the Atari. A.N.A.L.O.G. is an Atari users magazine!

Okay, all of us need software — it may be possible to coax a good deal of it from our readers who would like to get credit for writing some neat programs and in that way help others — plus the not inconsiderable impetus of the payments for articles we publish. A couple of good programs could go a long way towards financing a new piece of equipment. We are also proud to report that all of the programs listed in the last issue were bug free and that most of our readers had little trouble in typing them in. Our biggest question was, "How do you get those funny bent arrows and triangle shapes?" Well, if they looked at Appendix F in the Basic Reference Manual, it would have made life a little easier.

So these are some of our aims — we'll see what happens — and please remember that A.N.A.L.O.G. is a medium for you to communicate with other Atari owners. The more we help each other, the better off everyone will be.

One commercial factor — now that we have pulled our own Atari products ad, it is the advertising that pays for A.N.A.L.O.G.'s publishing costs, not the subscriptions or the counter sales. This means that the more you let our advertisers know that you are getting their message in our pages, the bigger and better your magazine will be. Send for their literature and let them know when you buy something that A.N.A.L.O.G. helped the sale.

DOING ANYTHING INTERESTING?

Are you doing anything interesting with your ATARI 400 or 800 Computer? A.N.A.L.O.G. and its readers are curious to know what applications YOU use your computer for. Our reading audience covers all professions from grade school children to educators, USAF pilots, and engineers. We would like to start a column featuring a different user every issue and what they use their ATARI for. Call 617-892-3488 10:00 AM to 7:00 PM EST or write to A.N.A.L.O.G., P.O. Box 23, Worcester, Mass. 01603. □

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READER COMMENT...

Dear Editor,

Your Bugs and Bytes feature on editing lock-up brought to mind my recent clash with the beast, and I thought that you and your readers might be interested to hear how I emerged victorious. After revising about fifty lines of a program, I tried to "CSAVE" hit Return, and found that the cursor simply disappeared. I hit Reset and tried again, but no go. I thought of the solution offered by the Basic Reference Manual (turn it off and lose your program!) and then I figured I better think again. After a number of unsuccessful ploys, I typed "BYE". Bingo! Up comes the Memo Pad. I had a feeling that when I hit Reset, everything would be Ready, and I wasn't disappointed. "CSAVE" started about two seconds later.

I can't guarantee that this will work every time, but it sure beats calling it quits and pulling the plug (or even listing after every few edits as you suggest). My victory may have been a small one, but it sure made me glad that I was born with a computer that has a little more range than "0" and "1".

By the way, if you want a little news filler, you might mention in the magazine that there is an effort being made to establish a National Atari Computer Net for radio amateurs (hams) on Monday nights at 8:00 p.m. EST on 14.329 MHz. The net has gotten off to a slow start because just when the publicity hit, the net control station W1UKZ, experienced some antenna trouble, and was off the air for some time. So if anyone is interested in getting on the radio and chatting about our favorite computer, please contact me.

Yours truly,
Sheldon Leemon

Dear Editor,

Hi! Forgot to tell you that I think the screen layouts in #1 are really nice, I haven't tried using them yet because I haven't made any copies. (I assume we have permission to copy those few pages(?)) But I will use them next time I write a program.

While we are on the subject of permissions, that has bugged me for a long time, but have never known any publishers to tell it to. The notice that everyone puts in their magazines says that nobody can copy anything without your (written) permission. Right? Could it or should it not be changed or amended or something to allow copying of non-article type material? Like ads and especially coupons for information or to order with. Who wants to chop up their magazines? Especially, GOOD ones like yours, (had to put that in) I realize that most people probably ignore the notice and copy anything and everything, but wouldn't it make more sense to allow copying of specific things "legally"? If I'm totally wrong, let me know, it wouldn't be the first (or last) time. But at least I found somebody to complain to.

I have a feeling you may know more about this than I, but I thought I would mention them in case you haven't and wish to discuss them in the magazine. The following are ATARI Tech Tips that correct or prevent several problems and the Customer does NOT pay for them even if the machine is out of warranty. (I will skip those that do not impact the end-user, service tips, part number changes, etc.)

#2 - 400 / Oscillating paddle while using the Super Breakout cartridge. This shows up as a very erratic paddle. It is corrected by adding a capacitor on the motherboard.

#4 - 800 / Machine remains in 'SELECT' condition when using the Basketball cartridge. It is corrected by removing three capicitors from the motherboard.

#9 - 825 / RF Interference. To minimize the interference, be certain that the coax cable coming from the rear of the Computer, extends away from or is layed at right angles to the I/O and printer cables. As an additional precaution, do not cross the printer cable with the power adapter cables.

#12 - 800 / Machines with 48K RAM using Star Raiders may invert the display. This is corrected by replacing one of the IC's with a higher revision.

Those are the current ones that a Customer may have experience with. ATARI has recently released upgrades for both the 400 and 800 to prevent the problems that were caused by card movement. And of course the gold-plated contacts.

So you are a Star Commander...I love that game. I haven't been playing too much lately and my highest rank was Lieutenant, Class 1. Well, I played one game last week and made it to Warrior, Class 1. In another couple years, I might catch up with you! Do you know about the alternate hyperwarp procedure, the one you don't have to steer for? It also isn't documented in the game description. Well, if you don't know, you can travel to a sector that you want to go to. Then press 'L' and 'H' and it will jump you up to the above sector easily. It does miss occasionally, but not anymore than when steering. It's great for when you have lost your computer but not long range (it doesn't work when LR is broke). The first time I played SR, I didn't have the instructions and found it by accident. I don't know if it detracts from your score either. But is is nice to know about!
Name & address withheld

It is okay to reproduce portions of A.N.A.L.O.G. for your personal use (ie. not for distribution). We encourage copying of certain things such as the graphic charts on pages 30, 31 and the driving controllers chart on page 35, both in Issue #1. Copying ads instead of cutting the magazine is also allowed of course. The copying of articles for distribution or even to give to a friend IS NOT ALLOWED by us, nor legally. Even photocopying an article may be defined as illegal. The programs listed in the magazine are for individual use only, and may not be sold nor copied. The programs are covered under the magazine's copyright protection. We hope clears up all your questions, and thanks for the info on Control Data's support on the ATARI. Most people seem very happy with the service they have received on any of their ATARI computer products. —Ed.

Dear Sirs,

With regard to your "Editing Lock-up" page 35 (Jan/Feb). I had a similar problem editing a long program. I found the cause to be hitting "System Reset" while the editor was working. The editor is usually very fast in Atari, but sometimes a period of a few seconds elapses when an edit change is made. I impatiently hit the "System Reset" while working on a program only to find that the system crashed. For a while I was afraid that it was a hardware problem. Thanks for the magazines devoted to Atari users.

Buehler
Andover, MA

Dear Sirs:

Please find enclosed my readers questionaire. There are a couple of items that I would like to bring to your attention, and hopefully someone at Atari will take Notice also. I have amended a couple of questions on the form since I first filled it out. The first: On a scale of 1-10, the question, How would you rate your Atari? I changed my answer from a 9 to a 6. The other question: Would you recommend your Atari to a friend? I changed that from a Yes to a No. The reason for the changes in my original answers is that since I filled out the questionaire, I've had nothing but trouble from my Atari 800. The main problem stems from corrosion of the contacts on the memory cards, ROM cartridges, etc. All of the RAM cards have the "Lubiplate" on the contacts, but that doesn't seem to help anymore. I feel that a more permanent solution would be to allow us Atari owners to take out the troublesome ROM & RAM cards, and trade them in for the new style gold plated versions. This might cost Atari quite a bit, but it would be worth it considering the service and repair costs. Anyway I will be returning my system to Control Data and have them go through it. Until Atari comes up with a permanent solution I will not change my mind regarding those questions. Just thought I would throw in my two-cents worth.

Johnie R. Gager
Spokane, WA

I will be interested in hearing from you after your system is repaired at Control Data. Along with the three step contact cleaning that will be performed by the service center, they upgrade various other areas in the earlier 400's and 800's. Now that's service. —Ed.
ED.

Dear Editor,

Thank you for sending me a copy of your magazine. The AXLON 256TM MEMORY SYSTEM for the Atari 800 is in final testing at this time. The AXLON 256 provides the capability to expand the Atari 800 to up to 256K-bytes of RAM using bank-select software. The system is designed to accomodate up to eight RAM memory modules. The system accepts AXLON's 32K RAMCRAM modules, two of which are included with the system, and/or Atari RAM modules. The system also includes the memory management software, interface card and cable, and has a dedicated power supply.

The system is installed by plugging the interface card into the second RAM slot in the 800. The ribbon cable runs out the back with no modifications required to the computer.

The software provided with the system is a modified DOS with the memory management software integrated into the system. The memory system simply acts like another disk on the 800. The user can utilize all the disk functions he presently uses.

The most obvious advantage of the AXLON 256 is speed. For example, the Atari 810 disk drive has a transfer time of 756 bytes per second, the AXLON 256 has a transfer time of 128,000 bytes a second.

I appreciate your interest. If you have additional questions please do not hesitate to contact me.

Robert Sultemeier
Product Marketing Manager
Axlon Inc.
170 N. Wolfe Road
Sunnyvale, CA 94086

Dear Sirs:

What can I say? Your magazine (newsletter) is the best thing to come along since the ATARI!! I am a little slow in getting this letter off to you because I was so involved in the articles and programs in your first issue! I have already come to respect your name — now just keep it up.

It was several years ago that I purchased a TRS-80, unsure of what I was going to do with it. I soon discovered that it couldn't mow the lawn or take the cat out! I wasn't discouraged, though. I had found a new

hobby! At that time the TRS-80 and Apple were still being explored. Each new program brought about a new concept and ability for the micro. Now there is a dearth of software and hardware for the TRS-80 and Apple. It was only six months ago that I purchased an ATARI. I now search out and read anything I can on the ATARI, as I did with my TRS-80, but it's much more exciting because of ATARI's hidden abilities.

I look forward to your next issue. Please enter my subscription so I don't miss out. My local computer store sold out of A.N.A.L.O.G. almost overnight!

OWEN C. HOGLE
1080 South 15th East
Salt Lake City, Ut. 84105

Dear A.N.A.L.O.G.,

I have just recieved your first issue, and after reading it thoroughly, I decided that it was up to me and other ATARI users to submit information. We need support! My article defines the Peek & Poke statements to confused beginners. Even though I am not an expert myself, I hope when you read through my article that you consider I am only 14 years old and in the 8th grade.....

What the PEEK and POKE Are You Talking About?
by Robert La Ferla

If you have ever listed a program or have skimmed through a page in the BASIC Reference Manual, you may have come across "Peek" and "Poke". In this article we will take a look at what these do, so you can poke it into your computer.

At first it may seem confusing, but it is really quite simple. Poke can be used in either the direct or deferred mode, Peek can only be used in the deferred mode. That is, Poke can be used only in a statement.

Now look at what each do. Poke is used to insert information (data) into a memory location. It can only be reset or cleared by SYSTEM RESET or another Poke statement. Note: System Reset only clears Poke in the direct mode.

EXAMPLES:
Direct Mode
POKE 755,4 — (try this and you'll find yourself upside down)

Deferred Mode
10 POKE 752,1 — (cursor inhibit; the '1' shuts off the cursor block)

How To Use
POKE aexp1, aexp2 (don't forget the comma)
aexp1=decimal address
aexp=data to be poked

Now that you have learned how to POKE, let's see how to PEEK. Peek is used to retrieve the information (data) from a specified memory address; in other words the number in parentheses. Peek can only be used in the deferred mode (in a statement).

EXAMPLE:
IF PEEK(764)=63 THEN SOUND 2,0,10,8
How To Use
10 IF PEEK(aexp)=aexp2 THEN...
aexp1=memory address
aexp2=specified number
OR
10 PRINT PEEK(aexp1)
10 PRINT PEEK(_$)

Here is a program that uses both "PEEK" and "POKE":

```
10 POKE 764,255: REM CLEARS KEYS
   PRESSED
20 PRINT CHR$(125) : REM CLEARS
   SCREEN
30 PRINT "ENTER THE LETTER 'B' "
40 IF PEEK(764)=21 THEN GOTO 50
45 GOTO 30:REM TRAP FOR INVALIDS
50 FOR C=1 TO 100 STEP 2
60 PRINT "THIS IS THE WAY TO PEEK
   AND POKE"
70 NEXT C
80 END
```

SOFTWARE FOR ATARI

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Software for the Atari†

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An extremely versatile, user oriented program for any grade level. Can be used with existing data base, user created data, or additional data cassettes. It features:

- Learning level – holds a word on the screen for you to study.
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- Comes with a data base of the most frequently misspelled words.
- Create your own data base. Store the words on cassette for future use.
- Change the words in the data base with one of the additional cassettes that are available.

SPELLBOUND DATA TAPES follow a phonetic sequence. Tape #1 begins with short vowel, three letter words and progresses to long vowel four letter words. The words on each cassette continue this sequence. All words in this series are grouped phonetically and by grade level whenever possible. All DATA cassettes contain 300 words.

SPELLBOUND $15.00
(master program with most frequently misspelled words) BASIC 24K

SB DATA TAPE #1 ..... $5.00
(short vowels/long vowels)

SB DATA TAPE #2 ..... $5.00
(short vowels/long vowels/blends)

SB DATA TAPE #3 (grades 2-4) $5.00
(blends/hard s/soft c)

SB DATA TAPE #4 (grades 2-4) $5.00
(diphthongs/homonyms)

SB DATA TAPE #5 (grades 3-5) $5.00
(silent letters/endings/compound words)

SB DATA TAPE #6 (grades 3-5) $5.00
(more diphthongs/double consonants)

SB DATA TAPE #7 (grades 4-6) $5.00
(compound words/endings)

SB DATA TAPE #8 (grades 4-6) $5.00
(words not covered in previous units)

ALL DATA TAPES REQUIRE THE SPELLBOUND MASTER PROGRAM.

MATH FACTS

A series of self-paced instructional programs for elementary school children. The programs in this series automatically advance to the next unit when the child has mastered 80% of the work generated by the computer. The previous unit will be reviewed if the child cannot master 50% of the work in a particular unit. Each unit builds on the skills developed in the previous unit.

MATH FACTS – LEVEL I $15.00
(16K BASIC, grades K-2) Concepts covered in this level are: numbers, number placement, number words (1-20), addition and subtraction (visual and abstract).

MATH FACTS – LEVEL II $15.00
(16K BASIC, grades 1-3) The child is guided graphically throughout this level. In the addition and subtraction units, the column on the right MUST be added or subtracted before the column on the left. This level includes: Number sequences to 100, greater than/less than (1-100), addition and subtraction (2 and 3 columns).

MATH FACTS – LEVEL III $15.00
(24K BASIC, grades 2-4) High resolution graphics aid the child in learning how to carry and borrow. Units in this level include: addition (3 number in one, two or three columns), addition (with carry) and subtraction (with borrow).

CON*PUTATION/TONAL ENCOUNTER ... $15.00
Two memory building programs on one cassette. CON*PUTATION is a 'concentration' game for two players. Match the equation behind one of the boxes with the answer or an equal equation. Each of the eight levels of play helps develop the child's addition, subtraction, multiplication or division skills. TONAL ENCOUNTER – play back the melody that the computer composes. Contains five different skill levels and an auto mode.

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ATARI NEWS....

Atari Accountant:

Due for release this summer: "The ATARI Accountant", a small business package entailing three parts. The Accounts Receivable System is designed to handle the processing of 300 customers at a time with a monthly maximum of 1200. It will keep track of open accounts as well as printing the same, and mailing labels as well. The General Accounting package will keep track of as many as 2700 transactions a month with up to 750 separate accounts; an impressive amount for a small system. It will also produce reports of balance sheets, general ledger, and accounts payable/receivable. Inventory Control will handle upwards to 1000 individual items and also handle the ordinarily time consuming chores of printing invoices, purchase orders, and packing slips. Combined with either of the other two packages, you can keep track of what is still on credit or has been 'payed off', etc. Requires a 48K system with the 815 dual drive system. Price to be announced.

Word Processor:

Those lucky enough to own an 800 and just happen to do a great deal of typing or letter writing, will love the soon to be released word processing package. Using an 800 with 48K, disk dive, 850 interface module, high quality printer (such as the 825), and the word processor, any document can easily be edited or arranged before hardcopy output. Specifically, this allows for the correcting of mistakes, deletion of unwanted text, the changing of words, sentences, or paragraphs, and "cleaner layouts" of printed matter. Because the computer system can 'remember' your paper (via the disk drive), when a final printout is made of your work it can be free of mistakes of any kind; and if it isn't, you can easily correct those errors and reprint the whole document without retyping the whole thing in again by hand. The saving of a file , of course, also allows you to run off as many copies of a letter or paper as needed.

The many features are easily available to the user, allowing you to move whole blocks of text anywhere on the "paper", be they paragraphs, sentences, or individual words. You can also underline, center headings or titles, indent or space paragraphs, automatically number pages, select between 80 and 132 characters per line, and right justify representation of your document as it appears in its' entirety. Using fine lines (graphics, not alpha-numeric) the screen shows how your "paper" looks (or how it will look); ie. how it is laid out. A "cursor window" shows the section you are currently working on. ATARI recommends a high quality printer such as the 825; certainly nothing like the 820 or 822 would suffice as a 'letter writing' printer. The ATARI Word Processsor is also tailored to the 825 giving you easy control over the various type faces and proportional spacing. To be available this summer. □

NEW PRODUCTS....

Microperipheral Coporation
P.O. Box 529
Mercer Island, WA 98040

Redmond, Wa. - The Microperipheral Corporation has just announced a new peripheral for the ATARI Model 400/800 Personal Computer System. The MICROCONNECTION for the ATARI is a direct connect modem for interfacing this popular computer to the national telphone network. Direct connection eliminates the need for noisy and unreliable acoustic coupled modems.

The MICROCONNECTION for the ATARI is Bell 103 compatible and operates in the originate or answer mode at 300 baud. It can be used for accessing The Source, MicroNet, computer bulletin boards and other computers for data transfer with hundreds of data bases in this country and Europe.

The product is unique in that it does not require the ATARI Model 850 (a parallel/serial RS232-C compatible interface unit). The modem is connected to the Model 800 computer console data port and employs software (supplied) for 300 baud data I/O.

Exclusive features of the MICROCONNECTION include the incorporation of a serial printer interface via a DB25 connector. Any printer, capable of 300 baud or more, will simultaneously reproduce whatever appears on the screen.

Another significant feature is the provision for on-line data storage. An inexpensive cassette recorder of your choice can be plugged into the MICROCONNECTION and will spool on-line communications for later playback.

Included with the MICROCONNECTION is a terminal communications program, power source and cable for interfacing to the ATARI 800 Personal Computer System. The price is $249.00.

An RS 232 version of the MICROCONNECTION is available for those with the Model 850 Interface Module. Important options for this product include an AUTODIAL/AUTOANSWER module and a special version which is compatible with European telecommunications standards. The RS232 model is $199.50, plus $24.95 for the connecting cable. The AUTODIAL/AUTOANSWER option is $79.00 extra.

The MICROCONNECTION measures 7.7 inches wide by 5.5 inches deep by 1.7 inches high and weighs less than one pound. For more information, contact the Microperipheral Corporation at 2643 151st Place N.E., Redmond, WA 98052, telephone (206) 881-7544.

ACTIVISION, INC.
3255-2 SCOTT BLVD.
SANTA CLARA, CA. 95051

Activision has announced the release of two new cartridges for use in ATARI's VCS game system. 'Freeway' and 'Kaboom!' are two "comedy-type" cartridges designed to be amusing as well as entertaining. 'Freeway' is an eight game variation of the old adage, "why did the chicken cross the road?"; here the player must use the joystick to maneuver a chicken across a ten lane freeway with difficulties ranging from light traffic, to bumper-to-bumper rush hour mayhem. 'Kaboom!' pits you against a maniac at the top of the screen, tossing bombs. You must catch the explosives in one of three buckets to douse the lit fuse, or one of your buckets is blown up! Both games retail for $22.95; available July, 1981.

AUTOMATED SIMULATIONS
PO BOX 4247
MOUNTAIN VIEW, CA. 94040

Three games in the EPYX series are now available for the ATARI. The first, 'The Datestones of Ryn', requires 32K and retails for $19.95. See review in next issue. 'Invasion Orion' is a "tactical space battle game" with the player controlling as many 9 space cruisers equipped with destructor and tractor beams, missiles and torpedos, competing against the computer. The program comes with Battle Manual and 10 scenarios, with provisions to make up your own scanarios and design your own ships. Requires 32K, $24.95. The third game, 'Rescue at Rigel', is a science fiction adventure game where the player has only 60 minutes to find and transport the 10 human captives from an alien moonbase to the rescue ship. His adversaries are the hostile Tollahs, two types of armed robots, a six-legged cerbanth, and a huge amoebic slug. Price is $29.95 and also requires 32K.

MANHATTEN SOFTWARE
PO BOX 35
PACIFIC PALISADES, CA. 90272

Manhatten Software has released a series of programs for the ATARI. The first four consist of GIN RUMMY 3.0; a regulation card game of Gin with graphics and sound. Requires 32K and lists for $19.95. CASINO BLACKJACK/COUNTER is a casino table simulation with card graphics showing 5 hands dealt with the player controlling the center hand, and the computer the others. The program is supposed to teach card-counting enabling a player to improve his/her card playing ability. $19.95 and requires 24K. In LABYRINTH RUN the player uses a joystick to guide a rapidly moving runner through twists, turns, and slaloms without hitting the walls. $14.95/16K. The fourth program is CONCENTRATION. Using full-color graphics, this is a version of the 'match the card' game for two players. 16K/24 K, $14.95. All games require joysticks.

ABOUT A.N.A.L.O.G. PROGRAM LISTINGS. THIS ISSUE USES A NEW PRINTING FORMAT FOR EASIER TO READ PROGRAMS.

THIS MEANS REVERVSE VIDEO
SEE APPENDIX F-1 IN THE BASIC REFERENCE MANUAL FOR THESE: ↰ ↑ ↓ → ← ▶ ◀ E꜀

BRAIN GAMES FROM PDI

Tired of shoot-em-up arcade games? Stimulate your brain for a change and have fun doing it. PDI has the best of the word puzzle games by Dr. Dean Victor for Atari*, Apple II* and TRS-80*.

MINICROSSWORD Computer invents a crossword puzzle on the screen. When the puzzle is formed, you fill in the words. If you can't supply a word, the computer will fill it in (and deduct points from your score!) Thousands of different puzzles can be generated.

WORD SEARCH Computer generates word search puzzles using either a Spanish, French or geography word list. Atari version uses color, sound and other special effects, and will even generate printed puzzles for you to do when away from the computer. This is an excellent way for students to practice foreign language vocabulary.

ASTRO-QUOTES This is an anagram-type game. The goal of the game is to guess a famous quotation. Clues are letters that the computer inserts in the correct slots in the quotation when the player correctly guesses the definitions of a series of words.

KROSS 'N QUOTES Quotation guessing game in which the player works against the clock. Player fills in the quote by picking scrambled letters and putting them in place using the joystick.

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Word Search: Spanish	16K	32K	16K	16K
Word Search: French	16K	32K	16K	16K
Astro Quotes	16K	32K	16K	16K
Kross 'N Quotes	NA	NA	NA	16K

*plus $1.50 shipping and handling
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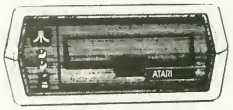
PDI

Program Design, Inc. Department CA 11 Idar Court Greenwich, CT 06830
203-661-8799

Disk Files: using Note & Point...



by Jerry White

We are beginning to see some business software available for ATARI personal computers. It's about time these marvelous machines were used to do more than play games. Personally, I use my 800 for personal finances, filing/mailing labels, letter writing, and disk program inventory.

If you like to write your own programs, I hope you will find my tutorials to be of some assistance. I've supplied a demonstration program that creates a 100 record inventory file and permits the user to update using random access. Note: You must be using ATARI DOS 2 since DOS 1 does not support note and point. Random access allows immediate access to any given record in a file without reading each record again and again.

The rest of this article assumes you have typed in the program. If there were no errors in typing, you should now have 3 options on the screen. First we must create a data file so type 1. This will send the program to line 100. We will now create a 100 record file to work with. Each record will contain a record number, an item count, and an item description field. Each field is separated by a comma. As the file is created it will be displayed on the screen. After record 100 is written, the file is closed and you will be returned to the 3 original options.

Now type the number 2. In order to use random access updating. We must know exactly where each record begins on the diskette. Before updating, the program will create an index using an array in memory. Once this is done, we can instantly find any record using the point instruction. But first, we must note the location by storing sector and byte in our arrays. We only have to do this once. Then we can inspect or change as many records as needed.

The index is created using the routine starting at line 300 and ending at 420. At line 500 is the beginning of the random access routine. You should be able to follow the program listing since the variables used will all be defined at the end of this article. At this time, I will only explain how the note and point instructions are used.

At line 310, we check a flag to see if an index has already been created. If so, we do not have to repeat this procedure and go to line 500. To create the index, we read the datafile. Before reading each record, we note the sector and byte position and put it into our SEC and BYT arrays.

Once the array is complete, we are ready to display or update any record in the datafile using the point instruction to locate the record we want. Let's start by displaying record 50. Type D and press RETURN. Then type 50 and press RETURN. At line 760, we point to the sector and byte of record 50. At line 780, we input that record, clear the screen, and display record 50 on the screen.

Remember the number of items in this record, then press and key and you will be returned to the option routine at line 5000. Type 2 and this time we will change record 50. Type U and press RETURN then type 50 and press RETURN. Record 50 will again be displayed but now we have 3 new options. Let's take them in order. Type 1 then press RETURN. To update the quantity, we merely add to it by typing the number of items to add, or subtract by typing a negative number. Remember that our quantity field is only 3 positions so don't increase it to more than 999 items.

When we read the record from the datafile, we stored in a string call REC$. The quantity field has just been updated in the string only. It will be updated on the disk only when we choose option 3 to exit. Before we exit, let's change the description field. Type 2 and press RETURN. Choose a new description and type it. Now type 3 and the record will be updated on the disk.

To be sure that the record has been changed properly, you can choose the display/update option then redisplay record 50. By now you see the advantages of random access updating. You don't have to read the first 49 records to get to record 50. Once the arrays of the sectors and bytes contain the beginning of every record, we can locate any record instantly.

```
20 REM INVENTORY TUTORIAL PROGRAM TO D
EMONSTRATE RANDOM ACCESS UPDATING
30 REM *** BY JERRY WHITE ***
50 DIM SEC(100),BYT(100),REC$(30),DES$
(30),CHOICE$(1):CI=0:GOTO 5000
100 REM *** CREATE INITIAL DATA FILE *
**
110 FOR BLANK=1 TO 30:REC$(BLANK,BLANK
)=" ":NEXT BLANK
120 CLOSE #1:OPEN #1,8,0,"D:DATAFILE"
130 REC$(4,4)=",":REC$(8,30)=",ITEM DE
SCRIPTION FIELD"
140 FOR RECORD=1 TO 100
160 IF RECORD<10 THEN REC$(1,2)="00":R
EC$(3,3)=STR$(RECORD):GOTO 220
180 IF RECORD<100 THEN REC$(1,1)="0":R
EC$(2,3)=STR$(RECORD):GOTO 220
200 REC$(1,3)=STR$(RECORD)
220 REC$(5,7)=STR$(RND(0)*100+100)
240 PRINT #1;REC$:? :? "RECORD ";RECOR
D:? REC$:NEXT RECORD
260 CLOSE #1:GOTO 5000
300 REM *** CREATE INDEX ***
310 IF CI=1 THEN RECORD=101:GOTO 500
320 TRAP 2000:CLOSE #2:OPEN #2,4,0,"D:
DATAFILE":TRAP 40000
```

```
360 FOR ARRAY=1 TO 100:NOTE #2,SECTOR,
BYTE
380 ? :? "RECORD ";ARRAY;"  SECTOR ";S
ECTOR;"  BYTE ";BYTE
400 SEC(ARRAY)=SECTOR:BYT(ARRAY)=BYTE:
INPUT #2,REC$:NEXT ARRAY
420 CLOSE #2:CLOSE #3:CI=1
500 REM *** RANDOM ACCESS DATAFILE ***
520 CLOSE #4:OPEN #4,12,0,"D:DATAFILE"
540 ? CHR$(125):? :? "TYPE D TO DISPLA
Y A RECORD":? :? "TYPE U TO UPDATE A R
ECORD";
560 INPUT CHOICE$:IF CHOICE$="D" THEN
700
580 IF CHOICE$="U" THEN 900
600 ? CHR$(253):GOTO 540
700 ? :? "TYPE RECORD NUMBER TO DISPLA
Y";:TRAP 700:INPUT RN:TRAP 40000
720 IF RN<ARRAY AND RN>0 AND RN=INT(RN
) THEN 760
740 ? CHR$(253):? "INVALID RECORD NUMB
ER":GOTO 700
760 POINT #4,SEC(RN),BYT(RN)
780 INPUT #4,REC$:? CHR$(125):? :? "RE
CORD ";RN:? :? REC$
800 ? :? "PRESS ANY KEY FOR OPTIONS:":
POKE 764,255:CLOSE #4
820 IF PEEK(764)<>255 OR PEEK(53279)<>
7 THEN POKE 764,255:GOTO 5000
840 GOTO 820
900 ? :? "TYPE RECORD NUMBER TO BE UPD
ATED";:TRAP 900:INPUT RN:TRAP 40000
920 IF RN<ARRAY AND RN>0 AND RN=INT(RN
) THEN 960
940 ? CHR$(253):? "INVALID RECORD NUMB
ER":GOTO 900
960 POINT #4,SEC(RN),BYT(RN)
980 INPUT #4,REC$:? CHR$(125)
1000 ? :? "RECORD ";RN:? :? REC$
1010 ? :? "TYPE 1 TO UPDATE QUANTITY":
? "TYPE 2 TO CHANGE DESCRIPTION":? "TY
PE 3 TO EXIT"
1020 TRAP 1000:INPUT CHOICE:TRAP 40000
1040 IF CHOICE<1 OR CHOICE>3 OR CHOICE
<>INT(CHOICE) THEN ? CHR$(253):GOTO 10
00
1060 ON CHOICE GOTO 1100,1300,1080
1080 POINT #4,SEC(RN),BYT(RN):PRINT #4
;REC$:CLOSE #4:GOTO 5000
1100 ? :? "TYPE POSITIVE NUMBER TO INC
REASE ITEMS":? "TYPE NEGATIVE NUMBER T
O DECREASE ITEMS"
1140 TRAP 1100:INPUT NUMBER:TRAP 40000
1160 ITEMS=VAL(REC$(5,7)):ITEMS=ITEMS+
NUMBER
1180 IF ITEMS>999 THEN ? CHR$(253):? "
ITEMS CANNOT EXCEED 999":GOTO 1100
1200 IF ITEMS<0 THEN ? CHR$(253):? "IT
EMS CANNOT BE A LESS THAN ZERO":GOTO 1
120
1220 IF ITEMS<10 THEN REC$(5,6)="00":R
EC$(7,7)=STR$(ITEMS):GOTO 1000
1240 IF ITEMS<100 THEN REC$(5,5)="0":R
EC$(6,7)=STR$(ITEMS):GOTO 1000
1260 REC$(5,7)=STR$(ITEMS):GOTO 1000
1300 ? CHR$(125):? :? "RECORD ";RN:? :
? REC$
1320 ? :? "TYPE NEW DESCRIPTION UP TO
22 POSITIONS"
1340 INPUT DES$:LD=LEN(DES$)
1360 IF LD>22 THEN ? CHR$(253):? "FIEL
D TOO LONG, EXTRA IGNORED"
1380 IF LD=22 THEN 1420
1400 FOR BLANK=LD TO 22:DES$(LEN(DES$)
+1)=" ":NEXT BLANK
1420 REC$(9,30)=DES$:GOTO 1000
2000 ? CHR$(253):? :? "DATAFILE NOT ON
 DISK:TRAP 40000"
2010 FOR WAIT=1 TO 500:NEXT WAIT:GOTO
5000
5000 REM *** INITIAL DISPLAY OF OPTION
S ***
5010 GRAPHICS 18:? #6;? #6;" INVENTORY
 OPTIONS:";? #6;? #6;"  1= CREATE FILE
"
5020 ? #6;? #6;"  2= DISPLAY/UPDATE":?
 #6;? #6;"  3= END PROGRAM"
5040 CLOSE #5:OPEN #5,4,0,"K:":GET #5,
GC:CLOSE #5:GC=GC-48
5060 IF GC<1 OR GC>3 THEN 5000
5080 GRAPHICS 0:POKE 82,1:SETCOLOR 2,0
,0:ON GC GOTO 100,300,6000
6000 GRAPHICS 0:POKE 82,2:END
```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You're Wasting Arrays...

By Charles Bachand

Memory space is an expensive thing. But as I see it, those precious chips are not being put to their full use. I'm not complaining about the programs that are being turned out, but of the inefficient use of memory space for storing numerical data. Simple variables like CAT = 5 or DOG = 10 or an expression like BOY = COULD-I-USE-A-DRINK are not at issue here. Arrays, like POINTS (80,40) used to store the pixels in graphics mode 4 or 5, are! This particular array uses up 19200 bytes of memory. How wasteful can you get. And what of those among us who have 8K or 16K machines. These people have just run out of money. So, you can either buy another RAM board, or you can read the rest of this article. After all, it's your money!

Now, I hope you don't think that I'm saying not to buy more memory. There are many programs coming out that will require an increase in RAM, or at least will benefit from it. However, I am saying not to add another memory board just to make up for poor programming techniques. The memory saving methods used here will show you how to cut down some of that wasted space by as much as 80% and may even speed up program execution, but first a few basics.

Numbers in ATARI BASIC are stored in six consecutive bytes in the computer's memory by a method known as BCD (Binary Coded Decimal). This procedure packs real numbers into the six memory locations, two digits per byte. Five of these six bytes contain the number and sign, while the sixth holds the value for the exponent. This is fine if you are using numbers like 194753 or 12.774 or even 12E22. But if you are using only integers in your array, and they just happen to range in value from 0 to 255 inclusive, then they can be stored easily in one byte locations.

The most convenient place in memory to put these values is a 256 byte space which ATARI has set aside for your own use. This block of RAM starts at memory location 1536 ($600 for you machine language programmers). Access to these locations can be gained in BASIC by using PEEKs and POKEs. To store a number X in the N'th element of such an array, the statement POKE 1536+N,X is used. To get a value out of this array we use the statement X=PEEK(1536+N). This method works, and it even runs faster than dimensioning an array. Don't forget to allocate space for each and every array. It would not be good to have them overlap each other. The best way to do this is to assign a different variable to each starting address. If array HOR is to have 10 elements, and array VER is to have 5,then the starting addresses would be HOR=1536, VER=+10, NEXT=VER+5. Done this way, the arrays will never meet each other. To store X in the 3rd element of VER, you would type the statement POKE VER+3,X. The offset from the base address of an array starts with zero, just as if it were dimensioned. Now, what if the arrays need more than 256 elements, or the arrays need more than one dimension. Well, just keep on reading. The best is yet to come.

In ATARI BASIC an array can have up to only two dimensions. This is a limit put on BASIC by the people who originally wrote it. BASIC takes the two index variables passed by the statement accessing the array, and by a series of multiplications and additions, arrives at the address of the variable stored in the array. Since your program is now to do all this work instead of BASIC, we have effectively cut out the middle man, namely the programmer who gave us the two dimension limit. Since we are now writing the array access software, we can set our own limits.

As an example, we will set up an array of size 5 by 9. Normally, we would type DIM XYZ(5,9) which would allocate 360 bytes to the array. Since we want to keep litter in its place, we are going to use the alternate method. The first dimension contains 6 elements (0-5) and the second 10 (0-9). Space must be set aside in memory (6 times 10 = 60 bytes) for the array. To access a value in the array, use this formula: (‹array address›+‹1st index›*‹2nd's limit› + ‹2nd index›). To read the (2,3) element of the above array, type A=PEEK(XYZ+I*6+J,X. It is really very simple. To handle a three dimensional array, we build on the two dimensional array. The formula in this case is: (‹array address› + ‹1st index›*‹2nd's limit›*‹3rd's limit› + ‹2nd index›*‹3rd's limit›+ ‹3rd index). In an array TEST(4,4,4), which has really 5*5*5 elements (0-4); to get the (X,Y,Z) value you type A=PEEK(TEST+X*5*+Y*5+Z). Simple, it is not. You can create 4 or 5 dimensional arrays this way. There is really no limit to it.

I found it to be easier if variables are defined that contain the limits of the compacted arrays. These variables simplify the calculation of the address offsets. The main reason to use variables for limits is that at times the number of elements in an array is not known until the program is executing.

This seems as good a time as any to issue a warning! You have to be careful that the indexes used by your programs do not exceed the defined limits. If the indexes should go out of bounds then the integity of your data will be lost. Data may be written to or read from the wrong position, or to and from the wrong array. If you start getting eroneous results, it is most likely for this reason.

Now, what do you do if the array or arrays use up more than the 256 bytes at address 1536. They will have to be put someplace else in the computer's

memory. But how does one set aside space for these arrays? We can't put them just anywhere. They might be overwritten by this program or system. The trick is to use the DIM statement, something we were trying not to do. However, we are not defining these arrays as numerical arrays. We're going to set them up as strings! That's right, you heard me the first time. We are defining the arrays as strings, but we are surely not going to use them this way.

There is an interesting function available in ATARI BASIC. It returns the address of a string array. Does this give you any ideas? We dimension a string array, and use the ADR(A$) function to be able to PEEK and POKE into it. The starting addresses in the preceeding examples are replaced with ADR(string array). Then, X=PEEK(1536+N) becomes X=PEEK(ADR(A$)+N) AND POKE XYZ+I*6+J,X becomes POKE ADR (XYZ$) +I*6J,X. After the string is defined, we replace all references to the starting address with the ADR function and the string variable name.

You might be wondering why we don't assign a variable to the address of the string. To let XYZ=ADR(XYZ$) seems sensible. After all, it cuts down on calls to the ADR function. This line of thinking makes a lot of sense, but it can cause problems. This has to do with the fact that string variable addresses can change as a program is running. This seems to happen only when a new numeric variable is encountered in a program, and BASIC has to make room for it. This is accomplished by pushing all the string space farther up in memory. It is safer to have the computer constantly recompute the string addresses. □

"MOIRE" GRAPHICS DEMO
Note: hit any key to stop

```
10 DEG
20 A=INT(1.9*160)
30 GRAPHICS 8+16
40 SETCOLOR 2,0,0
50 FOR I=0 TO 160 STEP 5
60 B=INT(I/2)
70 COLOR 1
80 PLOT 0,B
90 DRAWTO I,160
100 PLOT A,B
110 DRAWTO A-I,160
120 PLOT 0,160-B
130 DRAWTO I,0
140 PLOT A,160-B
150 DRAWTO A-I,0
160 NEXT I
170 IF PEEK(764)<>255 THEN END
180 GOTO 170
```

RUMORS...

Have You Heard The One About...

...rumors about a graphics chip for the ATARI 825 printer

...a multi-player Star Raiders with advanced capabilities: landing on asteroids to partially refuel and swooping down into planets atmospheres and bombing alien cities

...the release later this year of a voice synthesizer and voice recognition system by ATARI

...a new operating system: with a 96K addressable memory bank

...a screen dump cartridge for the 800's right hand slot; prints what's on the screen to hardcopy

...Telelink II; "a smart terminal emulator" with graphics capability and upload/download abilities

...from Microtek: an EPROM burner (make your own cartridges), A/D & D/A converters (hook your ATARI up to outside sources — you can control things), BSR unit (have your ATARI turn lights in the house on and off, etc.)

...80 column screen formatter!

...a word -processor on a ROM!

...Galaxian for the ATARI!

...an ATARI 400 with built-in modem — with no internal microprocessor (to be used as a dumb-terminal)

...ATARI's are now being used in the CUBE system in Columbus Ohio. It is part of the two-way television communication system.

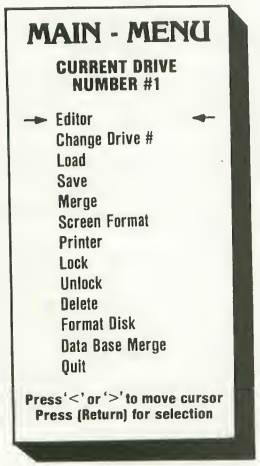
...And the ATARI Program Exhange:
This department will handle the marketing of third party software and also sell software from ATARI under this name.

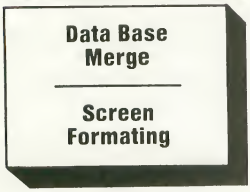
Programs to be released initially:

Adventure games
Avalanche
Baseball
Cross Referencer
Forth Language
A Star Trek game
A Sound Developement System
Othello
Turtle Language...and much more □

LETTER PERFECT T.M. LJK

WORD PROCESSING FOR THE ATARI — 800 T.M.





EASY TO USE: LETTER PERFECT is a character orientated word processor with the user in mind. The program (machine language) is very fast. It is a menu driven program that is very easy to operate. The program is a single load program and can work with one or more disk drives. It requires a minimum of 16K of memory and a single disk drive. With the Artari 825 printer you can print text with right hand justification. You may also use different type fonts (10 and 17 character per inch) within the body of the text itself. Boldface is printed as expanded print font. Underlining can be done as well as sending Escape characters within the body of the letter itself. All the formats are a default but you can change them all to desired values if you wish. Right Margin, left margin, top of form, line spacing, etc. are easily changed. Data Base Merge works with the sister program LETTER PERFECT—DATA BASE MANAGER. User may use this program to create mailing lists and completely develop your own data base for your personal needs. All text packed before storage to diskette for greater storage capacity. Large Buffer allows you to pick up and move up to one full page of screen text and move it to any location in the text. Merge more than one file together for easy editing. Screen Format allows you to see on the video screen exactly how the text will appear on the printer. Automatic page numbering, headers and footers are easily accomplished. This program is easy to use because of its meaningful and easily mastered commands. Fully documented with a users manual that explains in simple language 'how to' completely use the program.

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Pause Scroll
Scroll Line at Time
Scrolling Speed Control
Move Cursor Down
Beginning of Text

MULTIFUNCTION FORMAT LINE
Standard Formats a Default
Formats Easily Changed
Right Justification
Left Margin
Page Width
Line Spacing
Lines Per Page
Form Stop
Set Page#
Top Margin
Bottom Margin

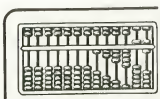
Delete a Character
Insert a Character
Delete a LIne
Insert a Line
Headers and Footers
Shift Lock and Release
Global and Local Search and Replacement
Underlining and Boldface
Automatic Centering
Horizontal Tabs
Special Print Characters
Split Catalog
Page Numbering up to 65535
Prints up to 256 Copies of Single Text File
Non Printing Text Commenting

FUNCTIONS
Delete All Text
Delete All After Cursor
Delete All Before Cursor
Delete Next Block
Delete Buffer
Move Next Block to Buffer
Add Next Block to Buffer
Insert Block From Buffer
Merge Text Files

SEND FOR FREE CONTROL PAGE

This program also available on the Apple in 40/80 Video (Super'R' Term, Smarterm, Videx, Bit-3). You may use any printer type. The Hays Micromodem II can be used to send files. Can be Reconfigured at any time to use different printer, 80 column board, or standard 40 column video. Much, Much, More!

DEALER INQUIRIES INVITED



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Balance your Checkbook...

by Charles Bachand

For this issue of A.N.A.L.O.G., I received a request for a Personal Finance program. The program that I developed can help you keep track of all the checks that you write in a month.

One of the nice features of this program, and one that should be added to any program that might be used by people not familiar with computers, is extensive error checking. Every effort should be made to see that your programs cannot bomb out. After all, how would you like it if while demonstrating your latest program, a letter was inadvertently typed where a number was expected? You would then have to explain what went wrong, when it could have been avoided. Wouldn't it be nice if the program simply asked you to type another response to the question. Hopefully, my program will give you some ideas along those lines.

The program is essentially self explanatory. The check numbers must be integers greater than zero. Month and Day must also be integers greater than zero. However, Month cannot be greater than 12, and Day cannot be greater than 31. "CHECK TO" can store any string up to 15 characters long. If you type the letter "D" instead of a name, the routine assumes that you wish to make a deposit. When the program asks you YES/NO type questions, it will only accept "Y" and "N" as valid answers.

This program by no means contains everything you would want in a Check Book Balancer. It would be nice to be able to save and retrieve the data from cassette or disk. Being able to sort the data, or to return to input mode after the data was printed to make corrections or deletions would also be a nice feature. It is up to you to build on this program and make it better.

EXPLANATION OF ROUTINES:

LINES 100-300

Dimensions and intializes data. Prints instructions and sets ADD mode option. Accepts initial balance for month.

LINES 500-600

Accepts individual check data with error checking.

LINES 1000-2000

Asks for output file or device name and prints out report.

LINES 4000-4010

Prints X four columns wide with leading zeros.

LINES 5000-5020

Accepts only "Y" or "N" from the keyboard and echoes it to the screen. If answer is "Y" then returns 1 in X, otherwise returns 0.

LINES 6000-6050

Prints X as dollars and cents. Dollars in five columns with leading blanks, ".", cents in two columns, and if minus, a trailing "+". Example, "199.50-".

LINE 5500

Same as above, except that dollars are printed with leading dollar sign "$" instead of leading blanks. Example, "$199.50-".

LINES 7000-7020

Prints data in format "mm/dd". Example, "04/09".

LINES 8000-8010

Inputs dollar amounts and divides by 100 if ADD mode in use. Returns value in X.

LINE 9000

Prints bars for various headings.

```
100 REM MONTHLY CHECK CHECKER
110 REM
130 DIM E$(15),EST$(1500),CHK(100),AMT
(100),S40$(40),A$(9),Z$(3)
140 EST$=" ":EST$(1500)=" "
150 EST$(2)=EST$:Z$="000":OPEN #1,8,0,
"E:"
160 POKE 82,1:SETCOLOR 2,11,1
170 S40$=EST$:SETCOLOR 4,11,1
180 PRINT "{CLEAR}";:GOSUB 9000:PRINT "Month
ly Checking Statement Accounter":GOSUB
 9000:CNT=0
190 PRINT "Copyright 1981 A.N.A.L.O.G.
 Magazine":GOSUB 9000:PRINT
200 PRINT "{RIGHT}This program allows you to
 enter":PRINT "amount values in calcul
ator ADD mode.":PRINT
210 PRINT "{RIGHT}Normally, amounts are ente
red":PRINT "as 9.95 or 5.00, but in AD
D mode the"
220 PRINT "program adds a decimal poin
t before"
225 PRINT "the last two digits."
230 POSITION 1,16:PRINT "Do you wish t
o use ADD mode ?";:GOSUB 5000:ADD=X
300 TRAP 300:POSITION 1,20:PRINT "{INVERSE}Pre
vious Monthly Balance ":GOSUB 8000:AM
T(0)=X
500 PRINT " ";:GOSUB 9000:PRINT "{RIGHT}Ente
r Individual Check Data":GOSUB 9000:CN
T=CNT+1:PRINT "{RIGHT}{RIGHT}Entry #";CNT
510 TRAP 510:POSITION 1,8:PRINT "{INVERSE}Chec
```

```
k Number:▶";:INPUT X:POSITION 15,8:GOS
UB 4000:PRINT S40$:CHK(CNT)=X
515 IF X<>INT(X) OR X<0 OR X>9999 THEN
 510
520 TRAP 520:POSITION 1,10:PRINT "↑Mon
th (1-12) ";:INPUT M:POKE 1536+CNT,M
522 IF (M<>INT(M)) OR (M<1) OR (M>12)
THEN 520
525 TRAP 525:POSITION 1,11:PRINT " Day
    (1-31) ";:INPUT D:POKE 1656+CNT,D
527 IF (D<>INT(D)) OR (D<1) OR (D>31)
THEN 525
530 POSITION 1,10:PRINT "↑↓Check Date:
▶";:C=CNT:GOSUB 7000:PRINT S40$
535 POSITION 1,12:PRINT "↑Check To (D)
:▶";
540 INPUT E$:D=0:A$="Amount":IF E$="D"
 THEN E$="DEPOSIT":D=1:A$="Deposit"
550 EST$(CNT*15-14,CNT*15)=E$:IF E$=""
 THEN 535
560 POSITION 15,12:PRINT E$;S40$
570 TRAP 570:POSITION 1,14:PRINT "↑$.$
$ ";A$;"▶";:GOSUB 8000:POSITION 15,14
:IF  NOT D THEN X=-X
580 AMT(CNT)=X:GOSUB 5500:POSITION 6,2
0
590 PRINT "Is Check Data Correct ?";:G
OSUB 5000:IF  NOT X THEN CNT=CNT-1:GOT
O 500
600 POSITION 9,22:PRINT "Any More Chec
ks ?";:GOSUB 5000:IF X AND (CNT<100) T
HEN 500
1000 PRINT "↰";:GOSUB 9000:PRINT "▶Sta
tement Printer Unit":GOSUB 9000
1010 TRAP 1010:POSITION 1,7:PRINT "↑Ou
tput Device (P=Printer,E=Screen)";:INP
UT E$:IF E$="" THEN E$="E:"
1020 CLOSE #1:OPEN #1,8,0,E$:TRAP 4000
:SETCOLOR 2,11,1:SETCOLOR 4,11,1:POKE
 82,0:IF E$(1,1)="E" THEN PRINT "↰";
1030 PRINT #1;"$Date Chk# Establish. $
 Amount  Balance":BAL=AMT(0):FOR I=1 T
O 9:PRINT #1;"----";:NEXT I
1035 PRINT #1;"---":PRINT #1:PRINT #1;
"Initial Balance.............";:X=BA
L:GOSUB 6000:PRINT #1:PRINT #1
1040 FOR C=1 TO CNT:GOSUB 7000:X=CHK(C
):GOSUB 4000:PRINT #1;EST$(C*15-14,C*1
5-5);
1050 X=AMT(C):GOSUB 6000:BAL=BAL+AMT(C
):X=BAL:GOSUB 6000:PRINT #1:NEXT C:PRI
NT #1
1055 PRINT #1;"Final Balance.........
.......";
1060 X=BAL:GOSUB 6000:PRINT #1:PRINT #
1:PRINT :PRINT "Again ?";:GOSUB 5000:I
F X THEN 1000
2000 END
4000 IF X<1000 THEN PRINT #1;Z$(INT(CL
OG(X))+1);
4010 PRINT #1;X;" ";:RETURN
5000 OPEN #2,4,0,"K:"
5010 GET #2,A:IF A>128 THEN A=A-128
5020 IF A>96 THEN A=A-32
5030 IF (A<>89) AND (A<>78) THEN 5010
5040 CLOSE #2:PRINT CHR$(A):X=(A=89):R
ETURN
5500 E$="$":GOTO 6010
6000 E$="    "
6010 S=X:X=ABS(X):XD=INT(X):A$=" ":IF
S<0 THEN A$="-"
6020 XC=INT((X-XD)*100):I=1:IF XD THEN
 I=INT(CLOG(XD))+1
6030 IF E$="$" THEN I=1
6040 PRINT #1;E$(I);XD;".";:IF XC<10 T
HEN PRINT #1;"0";
6050 PRINT #1;XC;A$;:RETURN
7000 X=PEEK(1536+C):IF X<10 THEN PRINT
 #1;"0";
7010 PRINT #1;X;"/";:X=PEEK(1656+C):IF
 X<10 THEN PRINT #1;"0";
7020 PRINT #1;X;" ";:RETURN
8000 INPUT X:IF ADD THEN X=X/100
8010 IF X<0 OR X>9999.99 THEN X=X/0
8030 RETURN
9000 FOR I=1 TO 18:PRINT "  ";:NEXT I:
PRINT :RETURN
```


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By Fabio Ehrengruber

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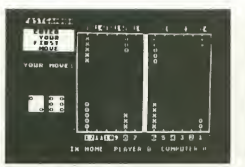

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By Bob Christiansen

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TANK TRAP
By Don Ursem

A rampaging tank tries to run you down. You are a combat engineer, building concrete barriers in an effort to contain the tank. Use either the keyboard or an Atari joystick to move your man and build walls. If you trap the tank you will be awarded a rank based on the amount of time and concrete you used up. But they'll be playing taps for you if you get run over. There are four levels of play. Higher levels of play introduce slow curing concrete, citizens to protect, and the ability of the tank to shoot through any wall unless you stay close by. Music, color, and sound effects add to the excitement. Written in BASIC with machine language subroutines. Requires at least 16K of user memory. Runs on the Atari 800 and on an Atari 400 with 16K RAM.

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QS FORTH™ By James Albanese. Step into the world of the remarkable FORTH programming language. Writing programs in FORTH is much easier than writing them in assembly language, yet FORTH programs run almost as fast as machine code and many times faster than BASIC programs. QS FORTH is based on fig-FORTH, the popular model from the FORTH Interest Group that has become a standard for microcomputers. QS FORTH is a disk-based system that can be used with up to four disk drives. There are five modules included:

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ASSEMBLER by Gary Shannon. Write your own 6502 machine language programs with this inexpensive in-RAM editor/assembler. Use the editor to create and edit your assembler source code. Then use the assembler to translate the source code into machine language instructions and store the code in memory. Simple commands allow you to save and load the source code to and from cassette tape. You can also save any part of memory on tape and load it back into RAM at the same or at a different location. The assembler handles all 6502 mnemonics plus 12 pseudo-ops that include video and printer control. Commenting is allowed and error checking is performed. A very useful feature allows you to view and modify hexadecimal code anywhere in memory. Instructions on how to interface machine language subroutines to your BASIC programs are included. ASSEMBLER requires 16K of user memory and runs on both the Atari 800 and the Atari 400.

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★ ★ ★ ★ ★ ★ ★ ★ ★

6502 DISASSEMBLER by Bob Pierce. This neat 8K BASIC program allows you to disassemble machine code, translating it and listing it in assembly language format on the video and on the printer if you have one. 6502 DISASSEMBLER can be used to disassemble the operating system ROM, the BASIC cartridge, and machine language programs located anywhere in RAM except where the DISASSEMBLER itself resides. (Most Atari cartridges are protected and cannot be disassembled using this disassembler.) Also works as an ASCII interpreter, translating machine code into ASCII characters. 6502 DISASSEMBLER requires only 8K of user memory and runs on both the Atari 800 and the Atari 400.

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PLAYER/MISSILE..... GRAPHICS

by Joseph Trem

This program demonstrates the use of player/missile graphics to simulate an animated space creature. By using the first joystick, you can move the creature around on the screen. Press the joystick button and you have the creature change color!

Here is a thorough breakdown of the program:

Line 10-16 ..... Draws background
Line 20 ..... Sets graphics 8
Line 40 ..... Sets color
Line 50 .....Gets player/missile address
Line 60 ..... Stores address inbase register
Line 70 ..... Enables DMA
Line 80 ..... Gets start address
Line 81-87 ..... Reads stick (0) & sets speed
Line 89 ..... Pokes horizontal postion
Line 90-92 .. Pokes vertical position of image one
Line 94-96 .. Pokes vertical position of image two
Line 97-99 . Pokes vertical position of image three

To create a figure, here is what you do. Draw the figure on a grid at least eight (8) squares wide. We used an 8 x 7 grid for our creature. Number the top of the grid as in our example. Fill in the dots to be lighted on the screen. In the first row across there are two dots, in positions 1 and 128. Your first vertical position will be 129 or (1 +128). The next would be 90 (or 1+8+16+64). Continue doing this until your entire picture is complete. Insert this data into line 91 and you have your creature.

128	64	32	16	8	4	2	1		
●							●	128+1	= 129
	●			●	●		●	64+16+8+2	= 90
		●	●	●	●			32+16+8+4	= 60
		●	●	●	●			32+16+8+4	= 60
		●	●	●	●			32+16+8+4	= 60
	●	●				●	●	64+32+4+2	= 102
●	●					●	●	128+64+2+1	= 195

To create animation we have inserted a slightly different image into each of the three lines (91, 95, & 98). Notice that lines 90, 92, 94, 96, 97, & 99 are used to erase the picture in the vertical position. If these lines are omitted, you will get some unerased dots on the screen.

In our example, we have used only one type of player. There are actually four players and four missiles that can be defined, or five players and no missiles. Here is some information to demonstrate what to use for different graphics modes and different players. Each player uses a 256 byte location. The vertical position runs from 32 to 223 in graphics 8 and 16 to 111 in graphics 7. The horizontal position runs from 41 to 200 in both graphics modes.

Experiment with different players. Have fun making your own games. And most of all...

DON'T LET THEM LITTLE INVADERS GET 'CHA!

```
GR. 7
I=PEEK (106)-4      PM ADDRESS          (LINE #50)
POKE 559, 46        SETS GRAPHICS MODE  (LINE #20)
STARTING ADDRESS    (LINE #80)
J=I*256+512         PLAYER 0
J=I*256+640         PLAYER 1
J=I*256+768         PLAYER 2
J=I*256+896         PLAYER 3
J=I*256+1024        PLAYER 4

GR. 8
I=PEEK (106)-8      PM ADDRESS          (LINE #50)
POKE 559,62         SETS GRAPHICS MODE  (LINE #20)

STARTING ADDRESS    (LINE #80)
J=I*256+1024        PLAYER 0
J=I*256+1280        PLAYER 1
J=I*256+1536        PLAYER 2
J=I*256+1795        PLAYER 3
J=I*256+2048        PLAYER 4

GR. 7 AND GR. 8
HORIZONTAL POSITION (LINE #89)      COLORS
POKE 53248,X        PLAYER 0        POKE 704, COLR   P-M 0
POKE 53249,X        PLAYER 1        POKE 705, COLR       1
POKE 53250,X        PLAYER 2        POKE 706, COLR       2
POKE 53251,X        PLAYER 3        POKE 707, COLR       3
POKE 53252,X        MISSLE 1        POKE 711, COLR       4
POKE 53253,X        MISSLE 2
POKE 53254,X        MISSLE 3
POKE 53255,X        MISSLE 4
```

PLAYER MISSILE GRAPHICS DEMO

```
10 GRAPHICS 8
11 SETCOLOR 4,0,0:SETCOLOR 2,0,0
12 REM **** SUPRESS CURSOR, PRINTS NAM
E
13 COLOR 1:POKE 752,1:? "            GA
ME DEMO"
14 REM **** DRAWS GAME BOARD
15 PLOT 0,0:DRAWTO 319,159:DRAWTO 0,15
9:DRAWTO 319,0:DRAWTO 0,0
16 FOR S=1 TO 319 STEP 5:PLOT S,1:PLOT
 S,158:NEXT S
20 POKE 559,62:REM * SETS GR.8
40 POKE 704,60:REM * SETS COLOR PINK
50 I=PEEK(106)-8:REM * GET P/M ADDRESS
60 POKE 54279,I:REM * STORE IN ADDRESS
70 POKE 53277,3:REM * ENABLE DMA(BASIC
)
80 J=I*256+1024:REM * GET START ADDRES
S
81 X=50:Y=50
82 S=STICK(0):B=Y+J:SOUND 0,0,0,0
83 IF S=10 OR S=14 OR S=6 THEN Y=Y-3
84 IF S=9 OR S=13 OR S=5 THEN Y=Y+3
85 IF S=10 OR S=11 OR S=9 THEN X=X-3
86 IF S=6 OR S=7 OR S=5 THEN X=X+3
87 IF STRIG(0)=0 THEN POKE 704,RND(0)*
255
89 POKE 53248,X:REM * SET X LOC.
90 POKE B+1,0:POKE B+2,0:POKE B+3,0
91 POKE B+4,129:POKE B+5,90:POKE B+6,6
0:POKE B+7,60:POKE B+8,60:POKE B+9,102
:POKE B+10,195
92 POKE B+11,0:POKE B+12,0:POKE B+13,0
93 IF S=15 THEN GOTO 100
94 POKE B+1,0:POKE B+2,0:POKE B+3,0
95 POKE B+4,0:POKE B+5,24:POKE B+6,255
:POKE B+7,60:POKE B+8,60:POKE B+9,36:P
OKE B+10,102
96 POKE B+11,0:POKE B+12,0:POKE B+13,0
97 POKE B+1,0:POKE B+2,0:POKE B+3,0
98 POKE B+4,24:POKE B+5,24:POKE B+6,60
:POKE B+7,126:POKE B+8,189:POKE B+9,36
:POKE B+10,66
99 POKE B+11,0:POKE B+12,0:POKE B+13,0
:SOUND 0,240,8,8
100 GOTO 82
```


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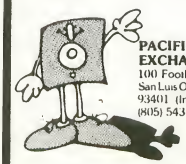

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UNLEASH THE POWER OF ATARI'S CPU

By Ed Stewart

Would you like to get as much as a 30% increase in speed from your Atari 6502 CPU? Would you also like to get this benefit without any additional capital expense? If your answer is no you probably don't like apple pie either, but if your answer is yes, read on, and I will tell you how to accomplish such a feat with one simple BASIC POKE in the right place.

First a little background information about one of the many things going on inside your ATARI computer. The particular thing that I want you to know about is how display information reaches your TV screen. There is a specific hardware chip called ANTIC that has most of the responsibility for seeing that the display gets to your TV screen. ANTIC does this by operating independently from the main 6502 CPU in your computer. ANTIC is in fact a primitive CPU in it's own right. It executes a program which is located in RAM just as the 6502 executes a program in RAM or ROM. We can therefore call the Atari a multiprocessing computer since more than one CPU may be active at any time. A peculiar and somewhat unfortunate thing happens when a multiprocessing system such as the Atari is actively executing instructions — both CPUs desire access to memory simultaneously. The two CPUs cannot both access memory at the same time so one must wait until the other completes it's access request. This memory access conflict is common to all computers containing more than one CPU — from micros to macros — and is generally not something to be concerned about.

The ANTIC chip fetches it's data from memory using a technique called "Direct Memory Access" or DMA. Whenever this memory fetch is occuring the 6502 is temporarily halted. DMA is said to be "stealing" a portion of the computer's available time called a cycle. There are 1,789,790 cycles of computer time available per second. If DMA had not "stolen" that cycle of computer time the 6502 would not have been halted and therefore would have finished it's program instructions sooner. It is only logical to conclude that the more this DMA activity occurs in behalf of the ANTIC chip, the more our 6502 will be slowed down.

The ANTIC chip re-displays the entire TV dispaly 60 times each second. During each of these 60 times many computer cycles are stolen from the 6502. During each of these 60 times the ANTIC chip also "interrupts" the 6502 and causes it to perform such tasks as updating various software timers and reading game controllers (joysticks and paddles). When the 6502 finishes what it must do in response to the ANTIC "interrupt" it may continue with what it was doing previous to being sidetracked by ANTIC. You should be getting the picture by now that although ANTIC is indispensable it causes a slowdown in the 6502 CPU, but how much?

I wrote a simple BASIC program for my Atari 800 in an attempt to answer this question. A FOR/NEXT loop was executed 100,000 times with no intervening statements as follows:

```
20 FOR I=1 TO 100000:NEXT I
```

The first thing to measure was how long this loop executes with no ANTIC DMA active. A POKE 559,0 turned DMA off and the TV screen went black. A POKE 559,34 turned DMA back on and the original display was restored. The FOR/NEXT loop was executed in graphics modes 0-8 with DMA active and the executive times were observed as shown in table 1. The execution times with DMA increased from as little as 10% for graphics 3 to as much as 47% for graphics 8. It is reasonable to see that if you do a lot of number crunching and you don't need the TV screen or the software timers and game controllers then turn off the ANTIC DMA for a while and you'll get your answer back sooner. It is also apparent from the chart below that your programs will execute faster if you are executing in graphics modes 3, 4, or 5.

I hope you have learned a little bit more about the Atari computer and how the ANTIC DMA interferes with the 6502 CPU. You may in fact someday be able to unleash that latent power within during a computer chess tournament, and when someone asks how in the world you did it you can smile and say — me and my DMA.□

GRAPHICS MODE	EXECUTION SECONDS	% INCREASE (over no-DMA)
NO DMA	148	
GRAPHICS 0	216	46
GRAPHICS 1	188	27
GRAPHICS 2	186	26
GRAPHICS 3	163	10
GRAPHICS 4	164	11
GRAPHICS 5	167	13
GRAPHICS 6	173	17
GRAPHICS 7	185	25
GRAPHICS 8	218	47

CANNON DUEL

By David Bohlke

Requires 16K

CANNON DUEL is a simulated artillery battle game for two players. Each players' cannon will be represented by a pillbox set in a randomly constructed terrain. As you enter the angle and velocity of your cannon blast, you will graphically see the trajectory of the projectile as it soars through the sky. In succeeding attempts, you must adjust your velocity or angle to score a hit on the opponents' pillbox.

To begin, plug a pair of joysticks into slot #1 & #2, and enter the names of the players. The player on the left will be represented by a red pillbox, and the player on the right will be blue. The player to shoot first is randomly selected. When it is your turn to shoot, slowly turn your joystick to select your angle; then press the fire button to register this value. Next, turn the joystick to select your velocity. Now, when you press the fire button, the projectile will be blasted onto its course.

If you score a first round hit, your score will be incremented by 9 points. A second attempt hit scores 8 points, third round seven points, etc. Should neither player score a hit after nine attempts, a new terrain will be constructed. The first player to score a total of thirty or more points will be the winner. Several key program routines are documented so you can personally adjust the terrain or other variables; if you wish.

1-70	initialization H(200) holds projectiles' trajectory (to be erased if a miss)
50	player to go first
60	plot terrain
64-70	input names, zero score (LS,RS)
100-110	plot new terrain
200-532	Main game loop P=1,2 indicates player on left, right PT holds points scored this round
200	increment score
205-206	if no hit in 9 shots, get new terrain
210-220	adjust color bar and name for P
222-254	input angle
270-294	input velocity
350-354	adjustments to angle, velocity
360-365	adjustments for left, right player
400-490	moves projectile through sky
400	T is time between plots (if too close, the projectile will self destruct)
410	projectile is off the screen
420	adjustment for height
430	projectile hit off bottom of screen
440	save projectile location
450-462	check for a hit
490	branch to time increment, continue
500-532	shot was a miss blank projectile path, go to next shot
600-620	right scored a hit
630-650	left scored a hit
680-692	end game message
700-712	plots explosion
900-992	plots terrain and cannon pillbox L2,R2 are vertical location of left, right L1,R1 are horizontal location of left, right A,B,C,D are variance in terrain
930-934	plots terrain
952-992	plots pillbox for each player

```
1 REM  CANNON DUEL
2 REM by  David Bohlke
10 DIM H(200),A$(7),L$(7),R$(7),A(1),V
(1)
20 RAD :GRAPHICS 7:SETCOLOR 4,0,10:POK
E 752,1
30 SETCOLOR 1,8,6:SETCOLOR 0,4,6:SETCO
LOR 2,13,8
50 A(0)=60:A(1)=60:V(0)=60:V(1)=60:P=1
:IF 0.5>RND(0) THEN P=2
60 GOSUB 900:PRINT " ENTER  name of pl
ayer on the :"
64 PRINT "LEFT ";:INPUT L$
66 PRINT "RIGHT ";:INPUT R$
70 LS=0:RS=0:GOTO 200
100 GRAPHICS 7:SETCOLOR 4,0,10:POKE 75
2,1
102 SETCOLOR 1,8,6:SETCOLOR 0,4,6:SETC
OLOR 2,13,8
110 GOSUB 900:PT=0
200 SETCOLOR 4,0,10:PT=PT+1:A1=0
205 IF PT=10 THEN ? :? :? " NO SCORE "
206 IF PT=10 THEN SETCOLOR 4,0,0:FOR I
=1 TO 300:SOUND 0,200,12,4:NEXT I:GOTO
 100
210 COLOR P:FOR I=75 TO 79:PLOT 0,I:DR
AWTO 159,I:NEXT I
220 A1=A(P-1):A$=L$:IF P=2 THEN A$=R$
221 GOSUB 800:PRINT ,"SELECT YOUR ANGL
E= ";A1;
222 A=STICK(P-1):IF A=15 OR A=11 OR A=
7 THEN 254
240 IF (A=14 OR A=10 OR A=6) AND A1<90
 THEN A1=A1+1
242 IF (A=13 OR A=9 OR A=5) AND A1>45
THEN A1=A1-1
250 PRINT "€€";A1;
254 SOUND 0,0,0,0:IF STRIG(P-1) THEN 2
22
270 A(P-1)=A1:FOR I=1 TO 100:SOUND 0,I
,10,4:NEXT I:V1=V(P-1):GOSUB 800:PRINT
 ,"SELECT YOUR VELOCITY= ";V1;
```

```
271 V=STICK(P-1):IF V=15 OR V=11 OR V=
7 THEN 294
272 IF (V=14 OR V=10 OR V=6) AND V1<99
 THEN V1=V1+1
274 IF (V=13 OR V=9 OR V=5) AND V1>10
THEN V1=V1-1
280 PRINT "++";V1;
294 SOUND 0,0,0,0:IF STRIG(P-1) THEN 2
71
350 V(P-1)=V1:A=A1*0.0175:V=V1
352 S=SIN(A):C=COS(A)
354 R=V*S:Q=V*C
360 K=L1:L=L2-5:IF P=2 THEN Q=-Q:K=R1:
L=R2-5
365 T=0.05:H=0:L=79-L
400 T=T+0.07:X=K+Q*T
410 IF X<0 OR X>159 THEN 500
420 Y=79-(R-16*T)*T-L:Y=Y*0.9:IF Y<0 T
HEN 400
430 IF Y>74 THEN 500
440 H=H+2:H(H)=X:H(H+1)=Y
450 LOCATE X,Y,Z
455 IF Z=0 THEN 480
460 IF Z=1 AND P=2 THEN 600
462 IF Z=2 AND P=1 THEN 630
470 GOTO 500
480 SOUND 0,Y,8,6
490 PLOT X,Y:GOTO 400
500 SETCOLOR 4,7,4
520 COLOR 0:FOR I=2 TO H STEP 2
521 SOUND 0,I,10,10
522 PLOT H(I),H(I+1):NEXT I
530 IF P=1 THEN P=2:GOTO 200
532 P=1:GOTO 200
600 RS=RS+10-PT
602 GOSUB 700
610 IF RS>29 THEN 680
620 GOTO 650
630 LS=LS+10-PT
632 GOSUB 700
634 IF LS>29 THEN 680
650 GOTO 100
680 PRINT " CANNON DUEL ♥ ♥ ♥ END OF
 CONTEST "
682 PRINT L$;" ";LS,R$;" ";RS
684 PRINT "Push the FIRE button for ne
xt game ?"
690 IF PTRIG(0)=0 OR PTRIG(1)=0 THEN R
UN
692 SOUND 0,RND(0)*200,14,4:GOTO 690
700 SETCOLOR 4,5,10
701 IF X>154 THEN X=154
705 FOR I=1 TO 35:SOUND 0,RND(0)*30+30
,4,14
706 SOUND 1,RND(0)*50+150,4,14
707 A=X+RND(0)*50-25:IF A<0 OR A>159 T
HEN 707
708 B=Y-RND(0)*70:IF B<0 THEN 708
709 PLOT X+RND(0)*5,Y+RND(0)*7:DRAWTO
A,B
710 SETCOLOR 4,RND(0)*16,10:NEXT I
712 SOUND 1,0,0,0:RETURN
800 POKE 77,0:PRINT :PRINT L$;": ";LS;
"  ";R$;": ";RS;"    SHOT: ";PT
810 PRINT "♦♦♦♦♦ ";A$;"'s TURN ";"♦♦♦♦
♦":PRINT :RETURN
900 COLOR 3:PRINT "       C A N N O N
 D U E L "
905 L=INT(RND(0)*40)+25:R=INT(RND(0)*4
0)+25
906 IF RND(0)<0.5 THEN L=71:GOTO 910
907 R=71
910 A=15+INT(RND(0)*60):B=85+INT(RND(0
)*60)
912 C=INT(RND(0)*(B-A)+1)+A:IF C<A+2 O
R C>B+2 THEN 912
914 D=INT(RND(0)*70)+1
916 L2=L:L1=A-11:R2=R:R1=B+6
930 FOR I=1 TO 9
932 PLOT 0,L:DRAWTO A,L:DRAWTO C,D:DRA
WTO B,R:DRAWTO 159,R
934 L=L+1:D=D+1:R=R+1:NEXT I
952 X=L1:Y=L2:COLOR 1:GOSUB 990
954 X=R1:Y=R2:COLOR 2:GOSUB 990
960 R1=R1+5:R2=R2+2:L2=L2+2:L1=L1+2
989 RETURN
990 PLOT X,Y-1:DRAWTO X,Y+3:PLOT X+7,Y
-1:DRAWTO X+7,Y+3:FOR I=3 TO 4:PLOT X+
I,Y-5:DRAWTO X+I,Y+2:NEXT I
992 PLOT X+1,Y+1:DRAWTO X+6,Y+1
999 RETURN
```

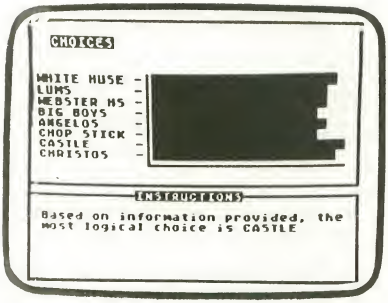
FLAG GRAPHICS DEMO

Note: hit "BREAK" key to stop

```
10 C=1
20 GRAPHICS 7+16
30 SETCOLOR 1,0,14
40 SETCOLOR 0,4,4
50 FOR I=0 TO 12
60 COLOR C
70 FOR J=0 TO 5
80 PLOT 0,I*6+J
90 DRAWTO 159,I*6+J
100 NEXT J
110 C=C+1
120 IF C=3 THEN C=1
130 NEXT I
140 COLOR 3
150 FOR I=0 TO 41
160 PLOT 0,I
170 DRAWTO 79,I
180 NEXT I
190 GOSUB 210
200 GOTO 200
210 REM STARS
220 COLOR 2
230 K=0
240 FOR I=0 TO 8
250 FOR J=0 TO 4
260 X=K+5+J*14:Y=4+I*4:GOSUB 340
270 NEXT J
280 IF K<>0 THEN 310
290 X=5+5*14:Y=4+I*4:GOSUB 340
300 K=7:GOTO 320
310 K=0
320 NEXT I
330 RETURN
340 PLOT X-1,Y:DRAWTO X+1,Y
350 PLOT X,Y-1:DRAWTO X,Y+1
360 RETURN
```

SOFTWARE REVIEW: DECISION MAKER

Color Computer Concepts
P.O. Box 1206
Kent, WA 98031
8K Cassette $8.95



Decision Maker from Color Computer Concepts is a very straight-forward and easy to use program. It can be a very helpful tool for aiding in the evaluation of complex decisions. If a choice must be made between ten or fewer options, the program prompts for the input of the choices and the characteristics held in common. For example: If you find it difficult making up your mind as to where you would like to go for dinner as was in my case, you would enter the names of the restaurants that you are considering, list the items that you feel are important in choosing a restaurant, i.e., service, food, price, etc. The program then gives you the name of one of the restaurants previously entered, and you must enter a two digit number for each of the attributes. These numbers are your rating for each restaurant's attribute. Once all information has been entered, the computer will then calculate the choices and give the results in the form of a graph.

Not a bad little program for only 8K. Decision Maker comes fully documented with descriptions of all subroutines, variables, and also a complete program listing for those who wish to enhance the program to their own needs. (A printout would be nice). One last thought, how come a company with the name Color Computer Concepts markets only utility programs and not games? □

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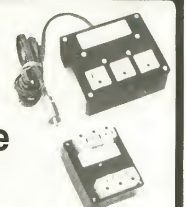

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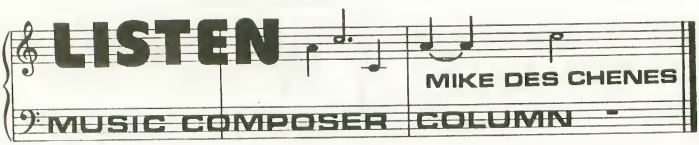


Thanks to our resident programmer, we can now enter some of our Music Composer compositions with ease. The Music Decomposer program listed below allows us to list music in our pages that can be easily typed in by you. In this issue, we have included the printout for:

Yellow Submarine.....

MUSIC DE-COMPOSER
by Charles Bachand

They say that Necessity is the Mother of Invention. It is even more so when you contribute to a computer magazine and want to submit a program that is for all intents and purposes unprintable. I am referring to the melodious files generated by the now famous Music Composer cartridge.

To share the music of life with a close friend would mean giving him or her a cassette or diskette containing the music files, with the instructions "Listen and enjoy". But in order to share a melody with the rest of the world, or at least those wise enough to subscribe to A.N.A.L.O.G., the musical notes have to be transcribed back to paper. This can be done in one of two ways. Either you can try to read all those notes that you entered into Music Composer, which is bound to lead to errors, or you can run the BASIC program known as MUSIC DE-COMPOSER.

This program will print everything you would want to know about a music program. I came across the idea for MUSIC DE-COMPOSER while reading the documentation for ATARI's Music Composer. Pages 14-15 of the manual were the most informative. They listed the formats in which music is saved. What a nice thing to include in a manual, it could come in handy later on! Immediately following this section was a program to list music files. But the excitement died when I realized that the program only printed the byte values of the file. What good is that? There has to be a better way, and that way is with MUSIC DE-COMPOSER.

MUSIC DE-COMPOSER produces a music program listing from which anyone can type his or her music into their computers. The formats and symbolism are the same ones used by the Music Composer cartridge. If you think that you are another Bach, feel free to run MUSIC DE-COMPOSER and share your music with the rest of the world. □

```
100 REM *** MUSIC DECOMPOSER ***
110 REM COPYRIGHT 1981 C.BACHAND
120 REM
130 DIM F$(15),C$(1),V$(14),N$(7),D$(6
),AC(21)
140 GOSUB 800:V$="0 PPP MPMFF FF":N$="
CDEFGAB":D$="TSEQHW"
200 GET #1,A:IF A=255 THEN PRINT #P:PR
INT #P;"END OF FILE":END
210 IF A<>170 THEN GOTO 200
220 PRINT #P:GET #1,A:IF A<128 THEN 30
0
230 PRINT #P;"MISCELLANEOUS":PRINT #P
240 GET #1,A:GET #1,B:PRINT #P;"METER=
",B;"/";A
250 GET #1,A:PRINT #P;"TEMPO=",A
260 GET #1,A:C$="S"
270 IF A>127 THEN A=A-128:C$="F"
280 PRINT #P;"KEY=",A;C$:GET #1,A:GOTO
 200
300 IF A<20 THEN 500
305 SETCOLOR 2,0,0
310 PRINT #P;"ARRANGE VOICE #";A/2-9:P
RINT #P:L=1
320 GET #1,A:IF A=255 THEN 200
330 PRINT #P;"#";L,:L=L+1:GET #1,B
340 ON A+1 GOTO 345,350,360,370,380,39
0,400
345 PRINT #P:GOTO 320
350 PRINT #P;"GOTO LINE ";B:GOTO 320
360 PRINT #P;"PLAY PHRASE ";B:GOTO 320
370 PRINT #P;"TRANSPOSE ";
372 IF B>128 THEN PRINT #P;"-";:B=B-12
8
375 PRINT #P;B:GOTO 320
380 PRINT #P;"VOLUME ";V$(B+B+1,B+B+2)
:GOTO 320
390 PRINT #P;"DISPLAY":GOTO 320
400 PRINT #P;"COUNT ";:GOTO 372
500 PRINT #P:PRINT #P;"PHRASE  #";A/2:
M=1
510 GET #1,A:IF A=255 THEN 200
520 GET #1,B:IF A=127 THEN PRINT #P:PR
INT #P;"MEASURE #";M:? #P:M=M+1:N=1:FO
R A=0 TO 21:AC(A)=0:NEXT A:GOTO 510
530 PRINT #P;"#";N,:N=N+1:B=B-1
540 IF A=85 THEN PRINT #P;"R";:GOTO 57
0
550 C$="":A=A/4:L=A-INT(A):IF L THEN C
$="S":A=INT(A):AC(A)=L:IF L=0.5 THEN C
$="F"
555 IF AC(A) AND C$="" THEN C$="N":AC(
A)=0
560 L=A-INT(A/7)*7+1:PRINT #P;N$(L,L);
C$;INT(A/7)+3;
570 C$="":IF B>127 THEN C$="T":B=B-128
580 F$="":L=INT(B/2)+1:IF B-INT(B/2)*2
 THEN F$="."
590 PRINT #P;D$(L,L);F$;C$:GOTO 510
```

```
800 GRAPHICS 2:PRINT #6;"          #########
##":PRINT #6;"   ### music ###":PRINT
#6;"  # de-composer #"
810 PRINT #6;" ##################":PRIN
T #6:PRINT #6:PRINT #6;" # ANALOG 400/
800 #":PRINT #6;" **** magazine ****"
860 PRINT "          ENTER OUTPUT FILE NA
ME":PRINT :PRINT "(RETURN FOR SCREEN,'
P' FOR PRINTER)";:P=0
870 INPUT F$:PRINT :IF LEN(F$) THEN P=
2:OPEN #P,8,0,F$
940 PRINT "          >ENTER MUSIC FILE NA
ME<":PRINT :PRINT "( HIT RETURN  IF FI
LE IS ON CASSETTE) ";
950 INPUT F$:IF F$="" THEN F$="C:":PRI
NT "  PLEASE TYPE RETURN ";
960 OPEN #1,4,0,F$:IF  NOT P THEN GRAP
HICS 0
970 RETURN
```

MISCELLANEOUS

METER=	4/4
TEMPO=	2
KEY=	1S

ARRANGE VOICE #4

#1	PLAY PHRASE 5
#2	PLAY PHRASE 6
#3	PLAY PHRASE 6
#4	PLAY PHRASE 5
#5	PLAY PHRASE 6
#6	PLAY PHRASE 6
#7	PLAY PHRASE 5
#8	PLAY PHRASE 6
#9	VOLUME MP
#10	PLAY PHRASE 6
#11	VOLUME P
#12	PLAY PHRASE 6
#13	VOLUME PP
#14	PLAY PHRASE 6

ARRANGE VOICE #3

#1	PLAY PHRASE 3
#2	PLAY PHRASE 4
#3	PLAY PHRASE 4
#4	PLAY PHRASE 3
#5	PLAY PHRASE 4
#6	PLAY PHRASE 4
#7	PLAY PHRASE 3
#8	PLAY PHRASE 4
#9	VOLUME MP
#10	PLAY PHRASE 4
#11	VOLUME P
#12	PLAY PHRASE 4
#13	VOLUME PP
#14	PLAY PHRASE 4

ARRANGE VOICE #2

#1	TRANSPOSE -12
#2	VOLUME MP
#3	PLAY PHRASE 1
#4	PLAY PHRASE 1
#5	PLAY PHRASE 2
#6	PLAY PHRASE 2
#7	PLAY PHRASE 1
#8	PLAY PHRASE 1
#9	PLAY PHRASE 2
#10	PLAY PHRASE 2
#11	PLAY PHRASE 1
#12	PLAY PHRASE 1
#13	PLAY PHRASE 2
#14	VOLUME P
#15	PLAY PHRASE 2
#16	VOLUME PP
#17	PLAY PHRASE 2

ARRANGE VOICE #1

#1	DISPLAY
#2	PLAY PHRASE 1
#3	PLAY PHRASE 1
#4	PLAY PHRASE 2
#5	PLAY PHRASE 2
#6	PLAY PHRASE 1
#7	PLAY PHRASE 1
#8	PLAY PHRASE 2
#9	PLAY PHRASE 2
#10	PLAY PHRASE 1
#11	PLAY PHRASE 1
#12	PLAY PHRASE 2
#13	VOLUME MP
#14	PLAY PHRASE 2
#15	VOLUME P
#16	PLAY PHRASE 2
#17	VOLUME PP
#18	PLAY PHRASE 2

PHRASE #6

MEASURE #1

#1	G3H
#2	G3H
#3	D3H
#4	D3H

MEASURE #2

#1	D3H
#2	D3H
#3	G3H
#4	G3E.
#5	E3S
#6	D3E.
#7	B3S

PHRASE #5

MEASURE #1

#1	D3Q
#2	A3Q
#3	FS3Q
#4	D3Q

MEASURE #2

#1	C3Q
#2	D3Q
#3	G3Q
#4	D3Q

MEASURE #3

#1	G3Q
#2	E3Q
#3	A3Q
#4	C3Q

MEASURE #4

#1	C3Q
#2	D3H
#3	FS3Q
#4	G3Q
#5	FS3H

MEASURE #5

#1	FS3Q
#2	C3Q
#3	D3Q
#4	D3Q

MEASURE #6

#1	B3Q
#2	E3Q
#3	E3Q
#4	A3H
#5	C3Q
#6	D3H.

PHRASE #4

MEASURE #1

#1	B4Q
#2	G4Q
#3	B4Q
#4	G4Q
#5	FS4Q
#6	D4Q
#7	FS4Q
#8	D4Q

MEASURE #2

#1	FS4Q
#2	D4Q
#3	FS4Q
#4	D4Q
#5	B3Q
#6	D4Q
#7	B3Q
#8	D4Q

PHRASE #3

MEASURE #1

#1	G4Q
#2	FS4H.
#3	E4Q
#4	B3H.
#5	E4Q
#6	C4H.
#7	E4Q
#8	FS4H.

MEASURE #2

#1	D4Q
#2	A3H.
#3	E4Q
#4	B3H.

MEASURE #3

#1	G4Q
#2	C4Q
#3	E4Q
#4	C4Q
#5	E4Q
#6	FS4H.

PHRASE #2

MEASURE #1

#1	D5Q
#2	D5Q
#3	D5Q
#4	D5E.
#5	E5S
#6	A4E.
#7	A4S
#8	A4E.
#9	A4S
#10	A4H

MEASURE #2

#1	A4E.
#2	A4S
#3	A4E.
#4	A4S
#5	A4H

MEASURE #3

#1	G4E.
#2	G4S
#3	G4E.
#4	G4S
#5	G4H

PHRASE #1

MEASURE #1

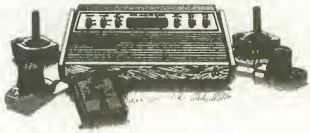
#1	B4E.
#2	C5S
#3	D5HT
#4	RE.
#5	B4S
#6	A4E.
#7	B4S
#8	G4H.

MEASURE #2

#1	B4E.
#2	B4S
#3	A4E.
#4	G4S
#5	E4QT
#6	RE.
#7	E4S
#8	B4E.
#9	B4S
#10	A4H.

END OF FILE

VIDEO COMPUTER SYSTEM UPDATE...



ATARI works hard to come up with new cartridges for use on their Video Computer System, but another company is equally devoted to manufacturing and distributing quality games for your enjoyment. That company is ACTIVISION. Located not far from the ATARI plant, in Sunnyvale, they have thus far produced 8 cartridges with several more due this year.

Titles released are Boxing, Bridge, Checkers, Dragster, Fishing Derby, Laser Blast, Skiing, and Tennis. Due on the market soon are "Ka-Boom!" and "Freeway", two "comedy" games that are hilarious as well as fun and challenging. How good are these games? Let's take a look at Bridge.

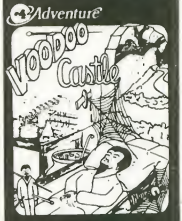
For the Bridge buff who is always looking for a fourth for a game of bridge, and can't find one. or doesn't enjoy the mechanical "Auto Bridger", Activision's ATARI interfaced bridge cartridge offers a real answer. It also proves to be an excellent teaching aid because a hand can be played over and over at various bids and suits. The programming follows the accepted methods of "point count" in terms of the response that the computer will make to the opening bid. However there is probably not enough info in the memory to allow bidding to be flashed by East and West which would not only offer a decided realism to the game, but would also allow one to "play" his hand more intelligently.

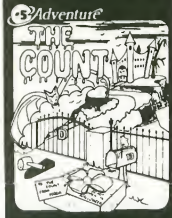
The computer understands and responds to Stayman and Blackwood conventions but ignores any artificial bids. As mentioned, although for the most part it will respond intelligently to your bid and the cards, and distribution it holds it will at times throw you a curve. I have had it rebid at the level three, a four card suit, at times making bids which although in keeping with count were not in keeping with distribution. Level of play is predicated on a total point count between "bidder" and partner and can be preselected. One discovers very easily in the game, that the secret to successfully making your bid is as in real play, the proper bids and play. There are four other levels in which one "enters" a bid passed only on his hand and attempts to make it without help in partners response. I found this of no personal value.

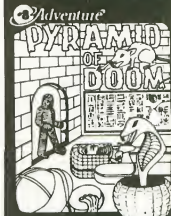
One can also "peek" at his partner's hand before bidding is begun and can also see East & West's cards at the end of the hand. Misplay of cards (not following a bid suit) are answered with a raspberry (buzz!). The play of the cards is made with ease using the joystick. And the graphics/colors are as up to par as the rest of the game. All in all, one of the better adult games to pique one's interest.

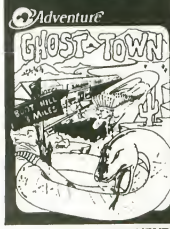
Adventure

BY Scott Adams









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8. **PYRAMID OF DOOM** - An Egyptian Treasue Hunt leads you into the dark recesses of a recently uncovered Pyramid. Will you recover all the treasures or more likely will you join its denizens for that long eternal sleep?. . . .
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A GRAPHICS "CLIPPING" ROUTINE...

By Tom Hudson

Probably every ATARI user who has ever dabbled in the graphics area has encountered the infamous "ERROR 141 - CURSOR OUT OF RANGE". This error message occurs when you try to PLOT or DRAWTO a point which is off the screen. The following program demonstrates a subroutine which may be used to eliminate this problem, while drawing the portion of the line that is off the screen:

The following program allows you to:

1. Define any shape (closed polygon)
2. Draw it to the screen in any scale
3. Rotate the object around a specified point

Type in the program and RUN it. You will see a square appear. It will begin rotating and increase in size until its' corners run completely off the screen, and it disappears altogether. Since the program is in an infinite loop, it is necessary to press the BREAK key to terminate execution.

HOW IT WORKS

LINE # FUNCTION

50 This line sets the size increment to 1.1. This means that each time the object is drawn, it will be 1.1 times the size of the previous plot. If SI is 1, the shape will stay the same size. If SI is .5 it will shrink to half its size each time it is drawn.

60 This line establishes the initial size of the shape. Since SF is 0.5, the object will start out as half as big as defined.

70 This line sets the rotation factor, the number of degress to rotate the shape each time it is drawn.

80 This line sets CX and CY, the coordinates where the object will be drawn on the screen. In this case, the object will be drawn at 80, 48, the center of the GRAPHICS 6 screen.

90 This line tells the clipping routine what the screen limits are. Since we are using GRAPHICS 6, (160x96), XL (X left)=0, XR (X right)=159, YT (Y top)=0, and YB (Y bottom)=95. If we were using GRAPHICS 5, the values would be XL=0, XR=79, YT=0, YB=47. By changing this statement, the clipping routine may be used for any screen resolution.

100-120 These lines read the data about the shape and scale it. The data statement is in line 450.

130-170 These lines perform the rotation function. The rotated points are moved to the X2 and Y2 arrays.

180 This line clears the screen for the next plot. (If this line were removed, some interesting patterns can be created).

200-210 These lines go through the shape data and send two points at a time to the clipping routine (lines 230-440). X1 and XY1 are the coordinates of the second point. These two points are the endpoints of the line to be analyzed by the clipping routine. The clipping routine determines if the line is on the screen and draws it.

230-440 This is the clipping routine. It accepts the two endpoints of a line (X1, Y1, and X2, Y2) and draws the visible portion of it on the screen. Since this routine is complicated, I will not give an in-depth explanation of it at this time.

450 This line contains the data describing the shape. The first number is the number of points in the shape. Since this is a square in this test program, there are 4 points. The next 8 numbers are the coordinates for the 4 points (refer to figure 1). Figure 1 is an X-Y coordinate grid which is helpful in designing a shape (ie. the charts in Issue #1, pgs. 30, 31). The shape rotates around the intersection of the X and Y axes (0,0) which in this case is the center of the n square. You can set up any shape you want by merely changing this DATA statement. Once again, the form is:

DATA n,X1,Y1,X2,Y2,...Xn,Yn

where n is the number of points in the shape.

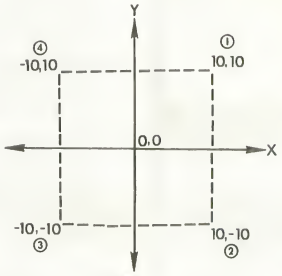

FIGURE 1

This program is highly flexible, and can be used to manipulate any number of shapes. By changing lines 50, 60, 70, 80, and 450 you can make any shape any size, any rotational position, and draw it anywhere

on the screen.

To use this routine in another program, use lines 90 and the 230-440 section. Set up X1, Y1, X2, and Y2 with the coordinates of the two endpoints in the desired line, and GOSUB 230. The subroutine will clip the line and redraw the portion that is on the screen (if any).

I will be happy to assist anyone having questions about specific applications of this routine. Write to Tom Hudson, 2369 E. Seminole, Springfield, MO 65804. My Micronet number is 70775,424. □

```
10 REM *** SHAPE ROTATION ROUTINE ***
20 REM BY TOM HUDSON
30 GRAPHICS 6+16
40 COLOR 1:SETCOLOR 0,10,4
50 SI=1.1
60 SF=0.5
70 RF=10
80 CX=80:CY=48
90 XR=159:XL=0:YB=95:YT=0
100 RESTORE 450
110 READ N:DIM X(N),Y(N),X2(N),Y2(N)
120 FOR X=1 TO N:READ W1,W2:X(X)=W1*SF
:Y(X)=W2*SF:NEXT X
130 FOR RD=0 TO 360 STEP RF
140 RW=RD*(3.14159/180)
150 FOR X=1 TO N:X(X)=X(X)*SI:Y(X)=Y(X
)*SI:NEXT X
160 FOR X=1 TO N:X2(X)=X(X)*COS(RW)+Y(
X)*SIN(RW)
170 Y2(X)=-X(X)*SIN(RW)+Y(X)*COS(RW):N
EXT X
180 GRAPHICS 6+16
190 FOR X=1 TO N:X2(X)=X2(X)+CX:Y2(X)=
Y2(X)+CY:NEXT X
200 FOR X=1 TO N-1:X1=X2(X):Y1=Y2(X):X
2=X2(X+1):Y2=Y2(X+1)
205 GOSUB 230:NEXT X
210 X1=X2(N):Y1=Y2(N):X2=X2(1):Y2=Y2(1
):GOSUB 230
220 NEXT RD:GOTO 130
230 L1=0:L2=0:R1=0:R2=0:T1=0:T2=0:B1=0
:B2=0
240 IF X1<XL THEN L1=1:GOTO 260
250 IF X1>XR THEN R1=1
260 IF Y1>YB THEN B1=1:GOTO 280
270 IF Y1<YT THEN T1=1
280 IF X2<XL THEN L2=1:GOTO 300
290 IF X2>XR THEN R2=1
300 IF Y2>YB THEN B2=1:GOTO 320
310 IF Y2<YT THEN T2=1
320 IF L1+L2=2 OR R1+R2=2 OR T1+T2=2 O
R B1+B2=2 THEN RETURN
330 X3=X1:Y3=Y1:X4=X2:Y4=Y2:GOSUB 390
340 L1=L2:R1=R2:T1=T2:B1=B2
350 X1=XW:Y1=YW:X3=X2:Y3=Y2:X4=X1:Y4=Y
1:GOSUB 390
360 IF X1<XL OR X1>XR OR Y1<YT OR Y1>Y
B OR XW<XL OR XW>XR OR YW<YT OR YW>YB
THEN RETURN
370 PLOT X1,YB-Y1:DRAWTO XW,YB-YW
380 RETURN
390 IF L1+T1+B1+R1=0 THEN XW=X3:YW=Y3:
RETURN
400 IF L1 THEN XW=XL:YW=Y3+(Y4-Y3)*(XL
-X3)/(X4-X3):X3=XW:Y3=YW:IF Y3>=YT AND
 Y3<=YB THEN RETURN
410 IF R1 THEN XW=XR:YW=Y3+(Y4-Y3)*(XR
-X3)/(X4-X3):X3=XW:Y3=YW:IF Y3>=YT AND
 Y3<=YB THEN RETURN
420 IF B1 THEN YW=YB:XW=X3+(X4-X3)*(YB
-Y3)/(Y4-Y3):X3=XW:Y3=YW:IF X3>=XR AND
 X3<=XL THEN RETURN
430 IF T1 THEN YW=YT:XW=X3+(X4-X3)*(YT
-Y3)/(Y4-Y3):X3=XW:Y3=YW:IF X3>=XR AND
 X3<=XL THEN RETURN
440 RETURN
450 DATA 4,10,10,10,-10,-10,-10,-10,10
```

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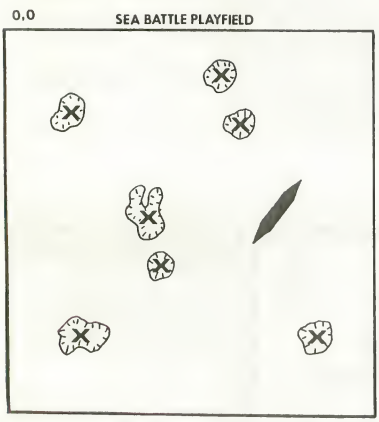
THE GAME ROOM

By Tom Repstad

In this new column we hope to accomplish a forum where readers can get reviews of games as well as information regarding the theory of games, hints, and tricks on how to write creative and interesting game programs. If you have any particular questions or problems about computer games, drop us a line, and we'll try to answer them through this column. In this issue I would like to address the problem of initializing computer games, in particular a method I have found that allows the computer to randomly distribute objects (ships, armies, treasures, etc...) around a playfield. It is assumed at this point that parts of the playfield are restricted (ie. not allowed for play for some reason).

For example let's say we are going to a naval battle game. One of the first things to do would be designing the playfield. I have laid out mine to look something like this:



The area's with an 'X' inside are islands, and are not allowed for play. Let us assume that we don't always want the same number of islands or to place them in a fixed position each time. The reason being twofold:

1) Maintaining a constant playfield can lead to the development of 'quick win' strategies on the part of the human player.

2) It can get quite boring when the player knows ahead of time what he can expect from the computer game.

The problem basically becomes how do we vary the playfield and place the computer's ship around the playfield randomly each time the game is played? There are further complications that are not readily apparent at this point, namely:

1) How do we randomly distribute n number of islands

2) How do we prevent overlapping of islands

3) How do we tell the computer where these islands are

4) And how are we going to randomly distribute our ships about the playfield without putting any in the islands.

This would appear to be a firmidable programming task, however, we can accomplish the entire procedure as well as having established a data base that we can easily access later in the program in less than 50 lines of code. Difficult you say? Not if you have 'SETEMUP' & 'ISITIN', two nifty subroutines that will do the bulk of all the work for us. We will take a look at them shortly, but first lets take a look at problem #1. A simple random number generator function can give us any number of random X,Y coordinates for n number of islands. What we would do prior to generating the random X, Y coordinates is to create a table of corner points that define our islands with a maximum of maybe 15 corner points per island. These cornerpoints would be expressed in the table as relative positions from the center of the island, we would in turn then add the random X,Y coordinates we just generated to the individual cornerpoints as a displacement value. We can also randomly select which of the island shapes we want from the island table.

Thus we would be effectively placing an island in the playfield that has a centerpoint of the random X,Y we just generated. As for problem #2, if we limit the size of the islands to fit within some relative radius, we can then use a simple distance check between the two X,Y coordinates that define the centerpoints of our islands. Note that each new island must be checked against all preceding islands.

This takes care of problems 1 and 2 , but 3 and 4 are a different matter. We cannot use the radius approach to place the ships around the playfield, remember we are defining the islands by a set of cornerpoints, the radius approach would cause much space that is valid to appear as being invalid to the computer. (To check this out draw an island, then draw a circle around the center of the island, making sure that no part of the circle touches the island!)

What is needed in this case is a simple approach with which we can determine if the point in question (ie. the ship), falls on one of our islands. We will probably also have the need to check this condition at later points in the program, not just in the initialization period. We could easily look at the board (screen) and determine if we had any ships on land (assuming we don't cheat!) and move them off. The computer however doesn't have any eyes (at least mine doesn't), so we have to develop some other method it can use to determine the same information. Which brings us to 'SETEMUP' and 'ISITIN'.

What SETEMUP does is to create some number of line equations describing the area(s) in question. This subroutine works for any regular or irregular shape. It works for any number of shapes, and set's up all for all those shapes simultaneously. As well as preparing all this information for the subsequent subroutine ISITIN. (Note: the subroutines are only limited by array sizes).

SETEMUP fills up five arrays with line equations representing the shapes I have defined, where does that leave us? It leaves us with ISITIN, which is a simple algorithm to determine if a point lies within the area's defined by the line equations from SETEMUP. If the given point lies on a line defining the area it is considered outside the area.

The pseudocode for the logic of placing the ships about would look something like this:

Step 1: Call SETEMUP for the islands defined earlier.

Step 2: Generate random X,Y coordinate, in the range 0,0 to 319,159 (Gr. 8).

Call ISITIN for the point just generated
if it's 'in' go back to Step 2.
store the ship location.
if we have more ships to place go to Step 2.
END

We can allow the player to determine the position of his own vessels or we can randomly distribute his vessel's as well. If we are going to randomly distribute his ships as well then we repreat steps 1 & 2, but for his ships. If we are letting him deploy his ships himself then we still repeat steps 1 & 2, but we remove the random point generator and substitute an 'INPUT X,Y' statement in it's place.

Now that we have an idea of what we are trying to do let's take a look at the programs themselves. First we define the variables into three classes: 1) INPUT - data that must be present when the subroutine is called. 2) OUTPUT - data generated by the subroutine. 3) INTERNAL - data that has no significance outside the subroutine.

For SETEMUP:

INPUT:
A = Array containing X values
B = Array containing Y values
C = Array containing number of corner-points for each shape
D1 = Number of areas (islands in our case)

OUTPUT:
T = Array containing upper X boundries
U = Array containing lower X boundries
D, E, F = Array's that contain the line equation values
N1 = Number of line equations generated

The remaining variables used in SETEMUP are internal.

For ISITIN:

INPUT:
X =Input X coordinate
Y = Input Y coordinate

OUTPUT:
Z1 = Logical variables,
if Z1 = TRUE (Z1 = 1) otherwise Z1 = False (Z1 = 0)

The remaining variables in ISITIN are internal.

Here is a quick example of how we would stuff data into SETEMUP, and subsequently call ISITIN to check a point. Let's assume we are only defining one area, it will have four corner points 1,1;4,1;4,6; and 2,5. We would set the following values in our program before we called SETEMUP:

```
5 D1 = 1
10  A(1) = 1 : A(2) = 4 : A(3) = 4 : A(4) = 2
20  B(1) = 1 : B(2) = 1 : B(3) = 6 : B(4) = 5
30  C(1) = 4
40  GOSUB nnn5 (CALLING SETEMUP)
50  X = 2
60  Y = 3
70  GOSUB nn205 (CALLING ISITIN)
80  Here we would test value of Z1
```

It is important that we only need call SETEMUP once in the beginning of the program to set up the line equations, unless your particular application allows the area's being defined to move during the game, in which case you would call SETEMUP prior to each call of ISITIN. As you can see by the example application above setting the data up for SETEMUP is very simple, and calling ISITIN is even more simple.

```
....0 DIM A(120),B(120),C(20),
      T(100),U(100),E(100),F(100),
      D(100)
....5 REM
...10 REM SUBROUTINE SETEMUP
...15 REM
...20 REM INPUTS: A,B,C,D1
...25 REM OUTPUTS: T,U,D,E,F,N1
...30 REM
...40 REM THIS SUBROUTINE DETERMINES
...42 REM LINE EQUATIONS, TOP AND
...44 REM BOTTOM LATITUDES OF THE
...46 REM LINE SEGMENTS AND THE TOTAL
...47 REM NUMBER OF LINES TO BE
...48 REM CONSIDERED.
...50 REM
...55 I1=1
...60 N1=0
...65 FOR I=1 TO D1
...70 I2=C(I)+I1-1
...75 FOR J=J1 TO I2
...80 N1=N1+1
```

```
...85 K=J+1
...90 X1=-B(J)
...95 X2=-B(K)
..100 Y1=A(J)
..105 Y2=A(K)
..110 IF Y1<>Y2 THEN GOTO 125
..115 N1=N1-1
..120 GOTO 185
..125 IF Y1<Y2 THEN GOTO 160
..130 T(N1)=Y2
..135 U(N1)=Y1
..140 D(N1)=Y2-Y1
..145 E(N1)=X1-X2
..150 F(N1)=Y1*(X2-X1)-X1*(Y2-Y1)
..155 GOTO 185
..160 T(N1)=Y2
..165 U(N1)=Y1
..170 D(N1)=Y1-Y2
..175 E(N1)=X2-X1
..180 F(N1)=Y2*(X1-X2)-X2*(Y1-Y2)
..185 NEXT J
..190 I1=I2+2
..200 REM RETURN
..205 REM
..210 REM SUBROUTINE ISITIN
..215 REM
..220 REM INPUT: X,Y,N1,T,U,D,E,F
..225 REM
..230 REM OUTPUT: Z1
..235 REM
..240 REM ...THIS SUBROUTINE
..242 REM    DETERMINES IF A GIVEN
..244 REM    POINT (X,Y) LIES INSIDE
..256 REM    THE GROUP OF AREA'S
..248 REM    DEFINED BY THE LIST OF
..250 REM    OF POINT DATA.
..255 REM ...THE DEFINED AREA NEED
..260 REM    NOT BE CONVEX
..265 REM ...IF THE GIVEN POINT LIES
..270 REM    ON A LINE DEFINING THE
..272 REM    AREA, IT IS CONSIDERED
..275 REM    OUTSIDE THE AREA.
..280 REM
..285 L8=0
..290 Z1=0
..295 X9=-X
..300 Y9=-Y
..305 FOR I=1 TO N1
..310 IF X>T(I) THEN GOTO 335
..315 IF X<=B(I) THEN GOTO 335
..320 L7=D(I)*X+E(I)*Y+F(I)
..325 IF L7=0 THEN RETURN
..330 IF L7<0 THEN L8=L8+1
..335 NEXT I
..340 L9=L8/2
..345 IF L9+2<>L8 THEN Z1=1
..350 RETURN
```

Using this method rather than 'LOCATE' to check for overlapping is much simpler. The ISITIN subroutine can be easily accessed and you don't have to use a color locate command to check every pixel (plotted point) to see is something is there. Now that I've given you some ammunition, you can put it to work. I'd be very interested to see the kind of applications you can mold this to, or any improvements you may suggest.□

"BOXES & SQUARES" DEMO

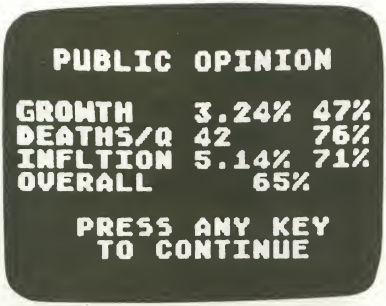
Note: hit any key to stop

```
10 GOSUB 400
20 GRAPHICS 23
30 FOR I=1 TO 32
40 X1=INT(RND(0)*160)
50 Y1=INT(RND(0)*96)
60 X2=INT(RND(0)*160)
70 Y2=INT(RND(0)*96)
80 IF X1=X2 OR Y1=Y2 THEN 40
90 COLOR INT(RND(0)*3+1)
100 PLOT X1,Y1
110 DRAWTO X1,Y2:GOSUB 400
120 DRAWTO X2,Y2:GOSUB 400
130 DRAWTO X2,Y1:GOSUB 400
140 DRAWTO X1,Y1:GOSUB 400
150 NEXT I
160 GOSUB 370
170 TRAP 330:J=0
180 GRAPHICS 7+16
190 X1=INT(RND(0)*80)
200 Y1=INT(RND(0)*48)
210 X2=X1+INT(RND(0)*80)
220 Y2=Y1+INT(RND(0)*48)
230 IF X1=X2 OR Y1=Y2 THEN 40
240 COLOR INT(RND(0)*3+1)
250 PLOT X1,Y1
260 DRAWTO X1,Y2:GOSUB 400
270 DRAWTO X2,Y2:GOSUB 400
280 DRAWTO X2,Y1:GOSUB 400
290 DRAWTO X1,Y1:GOSUB 400
300 X1=X1+2:Y1=Y1+2
310 X2=X2-1:Y2=Y2-1
320 GOTO 240
330 J=J+1:TRAP 330
340 GOSUB 370
350 IF J<4 THEN 180
360 GOTO 20
370 FOR K=1 TO 500
380 IF PEEK(764)<>255 THEN GRAPHICS 0:END
390 RETURN
400 T=10:V=RND(1)*10
410 FOR X=0 TO V STEP 10
420 R=R+1:IF R=4 THEN R=0
430 SOUND R,V,T,14:NEXT X
440 RETURN
```

SOFTWARE REVIEW - ATARI ENERGY CZAR

The year is 1980. The President of the United States has just appointed you Energy Czar and given you full power to guide the nation through the energy crisis and regulate energy resources. Sound tough? Well, if you're one of the millions of people who think that they have all the answers to this current day dilemma, then Atari's Energy Czar will give you a chance to see how well you'd do if given the opportunity.

Atari's Energy Czar is a very realistic, educational simulation of the energy situation in the United States. Your task is to try and solve the problems of increasing demands, decreasing supplies, and the rising costs of energy. To combat these energy problems, you have been given the power to promote or restrict supplies of the energy resources. Your options of power include the rationing of supplies, the raising or lowering of taxes, price regulating, and the authority to tighten or loosen the environmental controls (don't let the power go to your head). However, just as in the real world, if you fail to make the people happy by not meeting the energy demands, then out you go!



In order to make the program more realistic and challenging, before you're in office, you must choose between three possible energy biases: Pro Fossil, Pro Nuclear, or Pro Solar. The bias selections tell the computer which set of numbers to use in determining prices, supplies, and safety factors for each of the energy resources. The bias selected will also determine the length of time it will take the player to become a "National Hero".

The program begins by selecting the bias. You are then prompted with the menu for 1980, (you always begin your term of office in 1980). The main menu lists the six charts available, PRICES, TAXES, DEATHS, SUPPLY, USAGE, and an OVERALL VIEW. These charts are used to review your policy options before enacting legislation. Once you are satisfied with your policies, and reviewed the overall chart, you then return to the main menu and enact legislation and hope for the best. While you are waiting for the computer to evaluate your decisions, the screen displays "PROCESSING PLEASE STAND BY" and begins a countdown.

The PUBLIC OPINION POLL rates your overall performance and the effects your policies have had on growth of the economy, inflation, and deaths from accidents and pollution. If at least 30% of the people think your doing a good job then you'll stay in office for another term. If you receive 75% or more then you'll become a "National Hero" and should consider entering politics. However, if you get less than a 30% rating then you'll be ousted from office.

I'm almost tempted to call Energy Czar a game, but the expression "entertaining simulation" seems more appropriate. At first glance, Energy Czar seemed as though it was going to be a statistical bore. However, every time I found myself being kicked out of office. I became more determined to try again. In the beginning, Energy Czar can be frustrating. A newcomer to the program may often lose without understanding why. I recommend reading the manual thoroughly before attemptting to play. You'll be surprised at the amount of interesting and useful information Atari included in the manual.

Atari's Energy Czar is a colorful and entertaining way of introducing users to the problems of the U.S. energy economy. It offers first hand experience in formulating energy policies, exploring energy policy bias, and will help users to discover the difficult trade-offs that must be made between energy needs. If you're into strategy or thinking programs, don't deprive yourself of Energy Czar any longer. List price $14.95 (16K) Cassette. □

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HARDWARE REVIEW: THE MOSAIC MEMORY EXPANSION KIT FOR THE ATARI 400

MOSAIC ELECTRONICS
PO BOX 748
OREGON CITY, OR 97045
$79.00 FOR KIT

by Tom Hudson

Are you one of the many Atari 400 owners with only 8K of memory? If so, you probably wish you could use the high-resolution GRAPHICS 8 mode. Don't despair, because Mosaic Electronics has introduced an expansion kit which allows the user to increase the 400's memory to 16K. It can be installed by anyone who knows how to use a soldering iron. It allows the use of the Atari's excellent high resolution graphics mode 8, and, of course, allows you to enter larger programs. This is especially important if you want to use the Atari Editor Assembler Cartridge with the cassette recorder. When using the cassette with the assembler, you must have your entire source program in memory at once, and with only 8K, there is not much room to work with.

The Expansion Kit

The expansion kit comes complete with everything you need except a screwdriver, a soldering iron and long-nosed pliers. You even get the solder and an IC puller (a small tool which allows easy removal of the old memory chips). The introductions are the best I've seen with such a kit, including a page of photographs to make the operation go much smoother.

The expansion is accomplished in three steps: disassembly of the computer, modification of the RAM board, and re-assembly. The instructions include a list of precautions which, if followed, will eliminate any problems. I will highlight the most important here.

The disassembly is the easiest part of the expansion. The trick is remembering how to put it all back together! After removing the four bottom screws, remove the top cover and keyboard (the keyboard ribbon must be **carefully** detached from the main circuit board). Take a few minutes to study the internal arrangement of the 400. Note the placement of the internal speaker and black video cable (behind the large metal enclosure). As you follow the instructions for disassembly, it may be a good idea to label all screws with masking tape, since they are not interchangeable (several different kinds are used).

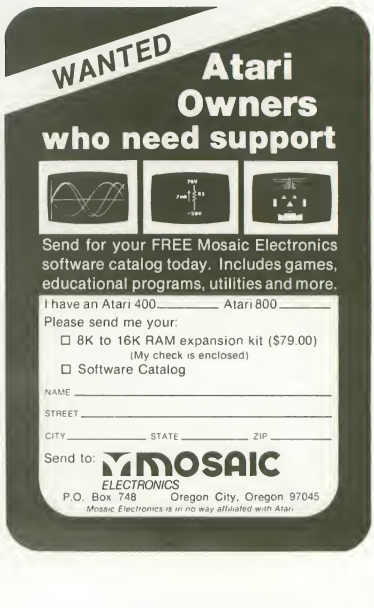
Next comes the actual modification of the RAM board. It is the small upright board toward the front of the 400. Note its orientation within the machine for later re-assembly. Follow the modification instructions carefully, and triple-check your work. Make sure no connections are shorted by stray solder.

After you have modified the RAM board, it is time to re-assemble the unit. The screws should be tight, but do not force them, especially the ones in the plastic enclosure. Be very careful with the keyboard ribbon cable, as overbending it can cause damage.

When your computer is re-assembled, insert the BASIC cartridge and turn on the power. The BASIC "READY" prompt should appear. If not, go back and check all your modifications. If you cannot locate the problem, Mosaic will do it for $1 shipping and handling. This shouldn't be necessary, though, if you follow the instructions carefully and check your work.

Remember that user modification of the Atari will void your warranty. However, if your machine is more than 90 days old, this makes no difference.

In summary, the Mosaic memory expansion kit is an excellent way for Atari users to expand their computer's capabilities. The reasonable price ($79.00) and easy-to-follow instructions make this a kit that practically anyone could build. Plus, those GRAPHICS 8 graphics look even better when you know you made it possible. □



SOFTWARE REVIEW — War at Sea

Custom Electronics, Inc.
238 Exchange Street
Chicopee, Mass. 01013

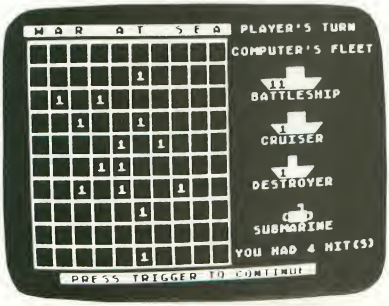
$14.95 for cassette/16K; $19.95 for diskette/24K

A popular game based on Milton Bradley's 'Battleship', War at Sea by Jerry White is one of the neatest games for the ATARI I have seen (He may not think so, but I think it's the BEST game he's written!). The object of the game is to sink your opponent's (the computer's) fleet, which consists of a battleship, cruiser, destroyer, and a sub. You start out by positioning your fleet horizontally and/or vertically on a 10 x 10 sector grid on the screen. You then select from an easy or difficult level, the difference being the amount of logic the ATARI uses; how smart it plays. Following this initialization, you can use the joystick to position your cursor (ship) over a sector, and hit the button to 'launch' your torpedos! You aren't notified of a hit until your round is over.

To see a hit, you check the 'warbook', a diagram of each ship on the right edge of the screen. A hit on a destroyer in the first round would appear as a "1" on the image of that ship. If you strike it on the third round, a "3" would then appear following the "1". Using this numbering system, you must deduct where a specific ship is located. Since you don't know if a ship has been hit until after a round, this is trickier than it sounds, as you may have 14 or more shots in a round! To sink a sub takes 2 hits — this vessel is the most troublesome to find. A destroyer needs 3 hits, a cruiser 4, and a battleship 5.

Sound being one of Jerry White's specialities, this game uses this ability to a large extent. The first few notes of "Anchor's Aweigh" signify the beginning of the game, and following the game set-up, you have all the sounds from a continuous 'gun-boat' engine muggle in the background, to the torpedos being launched and splashing in the water! Other tonalities include the 'electronic' equipment sound of the sub (with periscope moving back and forth at the same time) and Morse Code heard faintly. Also after a round by either you or the computer, the sounds and 'flashing' of the direct light communication used between ships when preferring radio silence. If the game is a draw (i.e. peace is declared because the game has gone on too long with no winner), a message appears in the form of a printout over the teletype with the slow printing of individual characters and the sound effects to match...

This gives you an idea of the detail in the game, it enhances what is a popular board-type game into a well-adapted computer game. Unfortunately, it is a one player game only, but I see no reason why it couldn't be changed to work with two player's competing to sink one another's fleet. □



USERS' GROUPS

Terry Barker
High Technology
1611 N.W. 23rd St.
Oklahoma City, OK 73106

Atari Computer Users Group of Houston
c/o David B. Mann
5651 Wigton
Houston, TX 77096

Atari Users Group
c/o Larry Kelley
416 No. 156 Ave.
Bennington, NE 68115

Portland Atari Club
c/o Jim Letterman
P.O.Box 1692'
Beaverton, OR 97075

Atari Computer User Group of Dallas
c/o Phil Shafer
3708 Big Horn Trail
Plano, TX 75075

Download Terminal!

by Robert Hartman & Lee Pappas

How much money have YOU spent on Compuserve listing to your printer or just plain reading off the screen. Well, no more... this program will allow you to store what is rushing by on your screen into RAM, and at the touch of a button transfer it all to your 810 Disk Drive. You can do this with Discovery Magazine on Compuserve, CB, or even program listings.

●●● You can use this program to LOG ON to Compuserve, the Source, etc; TELELINK 1 is not required. To use a program saved to disk through this method, use ENTER, not LOAD. You may wish to save all of the data into RAM before logging off, than save it all to disk.

```
    TRANSLATION DETERMINES HOW
    MUCH ATASCII-ASCII THE ATARI's
    I/O ROUTINES WILL TRANSLATE.
    USE LIGHT TRANSLATION FOR
    COMPUSERVE INFORMATION
    .       SERVICES.
    ********************************
    USE START TO BEGIN FILLING
    RAM. SELECT WILL SAVE TO DISK.
    USE THE DOS COPY COMMAND [C]
    TO THE EDITOR [E:] OR
    THE PRINTER [P:].
    ********************************
    USE DOS II ONLY! BE SURE THE
    RS-232 HANDLER IS BOOTED!
    THIS IS NOT FOR INTERACTIVE
    USE (IE. CB, 2 WAY COM.)
10 FOR I=1648 TO 1742:READ A:POKE I,A:
NEXT I
20 DATA 162,32,169,7,157,66,3,169,0,15
7,72,3,157,73,3
30 DATA 32,86,228,133,208,201,31,16,6,
169,32,133,208,104,96
40 DATA 168,162,0,169,11,157,66,3,169,
0,157,72,3,157,73
50 DATA 3,152,32,86,228,104,96,0,162,1
6,169,7,157,66,3
60 DATA 169,0,157,72,3,157,73,3,32,86,
228,133,208,168,162
70 DATA 32,169,11,157,66,3,169,0,157,7
2,3,157,73,3,152
80 DATA 32,86,228,104,96
90 GRAPHICS 1+16:DIM D$(1):LSCH=764:CO
N=53279
100 POSITION 1,3:? #6;"*analog present
s*":POSITION 1,4:? #6;"download termin
al"
110 GOSUB 230:D$=" ":POKE 580,0
120 IF PEEK(LSCH)=255 THEN D$=CHR$((RN
D(0)*124)):GOSUB 240:GOTO 120
130 D$=" ":GOSUB 240
140 POSITION 1,10:? #6;"TRANSLATION MO
DES":POSITION 2,12:? #6;"option ↓ ligh
t"
150 POKE 710,PEEK(710)+2:POSITION 2,13
:? #6;"SELECT = HEAVY":POSITION 2,14:?
 #6;"start  = none"
160 IF PEEK(CON)=7 THEN R=RND(0)*124:P
OSITION 1,3:? #6;CHR$(R):POSITION 17,3
:? #6;CHR$(R):GOTO 160
170 IF PEEK(CON)=6 THEN POKE 208,32:GO
TO 210
180 IF PEEK(CON)=5 THEN POKE 208,16:GO
TO 210
190 IF PEEK(CON)=3 THEN POKE 208,0:GOT
O 210
200 GOTO 160
210 IF PEEK(CON)<>7 THEN 210
220 ? :? :? "CLR:GR.0:RUN ";CHR$(34);"
D:TERMINAL";CHR$(34):POSITION 0,0:POKE
 LSCH,12:END
230 POKE LSCH,255:RETURN
240 FOR I=0 TO 19:POSITION I,6:? #6;D$
:POSITION I,1:? #6;D$:POKE CON,0:NEXT
I:RETURN
```

```
10 REM NOTE: SAVE THIS AS "D:TERMINAL"
20 DIM A$(15),D$(15):D$="D :":S=ADR(D$
)+20:L=S:C=764:O=53279:F=FRE(Z)-125:Z=
0
30 OPEN #1,4,Z,"K:":TRAP 180:OPEN #2,1
3,Z,"R:":XIO 38,#2,PEEK(208),Z,"R:":XI
O 40,#2,Z,Z,"R:":? #2;CHR$(17)
40 GOSUB 290:TRAP 40000
50 STATUS #2,V:IF PEEK(747) THEN X=USR
        (1648):POKE L,PEEK(208):L=L+1:
GOTO 50
60 IF PEEK(C)<>255 THEN X=USR(1701)
70 IF PEEK(D)=5 OR L-1>F+S THEN 100
80 IF PEEK(D)=6 THEN ? :? "filling buf
fer":L=S:GOSUB 300
90 GOTO 50
100 GOSUB 300
110 ? :? "Enter Filename ";
120 TRAP 40:INPUT A$:IF LEN(A$)=Z THEN
 40
130 IF LEN(A$)<3 THEN A$(LEN(A$)+1)="
  "
140 IF A$(1,1)="D" AND (A$(2,2)=":" OR
 A$(3,3)=":") THEN D$=A$:GOTO 160
150 TRAP 150:? "Enter Drive Number ";:
INPUT Q:D$(2,2)=STR$(Q):D$(LEN(D$)+1)=
A$
160 ? #2;CHR$(19):TRAP 180:CLOSE #1:CL
OSE #2:OPEN #3,8,Z,D$
170 ? :? "saving to disk":FOR I=S TO L
:X=PEEK(I):PUT #3,X:NEXT I:CLOSE #3:?
"I/O complete":L=S:D$="D :":GOTO 30
180 CLOSE #3:A=PEEK(195):IF A=130 THEN
 GRAPHICS 2:? :? "850 INTERFACE NOT BO
OTED":? "REBOOT AND TRY AGAIN":END
190 IF A=138 THEN ? "DEVICE TIMEOUT, T
URN ON DEVICE, "
200 IF A=162 THEN ? "DISK FULL, REPLAC
E DISK AND ";
210 IF A=165 THEN ? "INVALID FILENAME,
 ";
220 IF A=167 THEN ? "LOCKED FILE, ";
230 IF A=169 THEN ? "DIRECTORY FULL, R
EPLACE DISK":? "AND ";
240 IF A<>Z THEN GOTO 260
250 ? "UNKNOWN ERROR, ";
260 ? "TRY AGAIN":POKE C,255:A=Z
270 IF PEEK(C)=255 THEN 270
280 GOSUB 290:GOTO 100
290 POKE C,255:RETURN
300 IF PEEK(D)<>7 THEN 300
310 RETURN
```

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By Stan Ockers

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ANGLE WORMS - For 2 players (Requires two joysticks, if "NONE" is entered for second player's name then one may play). Each player attempts to prevent his growing worm from hitting an obstacle! Each worm may fire a projectile from its head to try and shorten its own length. Watch for the walls!

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ATARI SOFTWARE REVIEW-CALCULATOR

By Peter Pappas

Whether you're into research, engineering, economic analysis, or "plain old boring homework", the time wasted performing conversions or calculations can be a nonprofitable experience. In order to conquer this boredom and resolve this conversion dilemma, man developed the abacus and as time and technology progressed moved on toward the first computers — huge machines these were with titanic proportions. Hundreds of cubic feet in size containing so many vacuum tubes that they consumed a great deal of electricity, produced much heat, and could do little more than the four basic mathematical functions. Then the digital computers came about soon after the invention of transistors and later, large scale integrated circuits. And soon after by the common pocket calculator, now turning into pocket computers. Is this development the ultimate mechanism to perform man's many calculations and conversions without having to tote a 1000 pound computer about?

If you answered yes to the above question, you can go to the back of the class. The solution to the question/problem lies in the new Calculator program from ATARI. Unlike the programmable calculator, the ATARI Calculator diskette provides the user with a simple and efficient means to perform any calculation or conversion in any field or disipline without having to (a) cope with an assortment and array of paper and (b) have any real background in computers, science, or economics. The ATARI diskette contains all of the formulas required to perform a multitude of conversions and calculations.

For the small businessman who might be interested in ascertaining his or her annual percentage rate, mortgage rate or profit yield, the ATARI Calculator can provide assistance in providing the answer. These financial functions along with compound interest, balloon payments and annuities, when combined with ATARI's Stocks and Bonds analysis programs provide the family economist or small business person with an array of financial functions to perform virtually all necessary budgeting and investment calcualtions. If your field requires statistic, algeraic or trigonometric functions, the ATARI program can perform these calculations admirably.

Calculations are not the only positive attribute of this new state of the art micro-computer program. Calculator also provides the ability to perform numerous scientific conversions ranging from farenheit/Celcius to Polar/Rectangular. Any one of these functions can be performed accurately and efficiently by following the format layed out in the Calculator manual. Or should I say book?
What you receive is a 115 page manual (book?) covering everything you need to know, and a lot of 'stuff' you may want to learn. But don't get confused into thinking this is a tough program to comprehend! In a few minutes you'll get the hang of it, and then you may want to page through the manual to see what else Calculator can do. While the ATARI Calculator program may not be as portable or as convenient for everyone, it does provide other advantages to the more portable programmable calculators now on the market.

FEATURES OF THE ATARI CALCULATOR:

- The ability of hardcopy output using any of the ATARI printers
- The ability to save and load numerical data from disk or tape
- You can define whether to use standard input or RPN (Reverse Polish Notation). RPN is generally preferred in scientific work
- Easy conversion between English/Metric systems
- Memory with displayable stack (you can see what's in memory) — You have 100 memory locations and can visibly see the first 10
- You have the ability to fix the amount of digits displayed to 8 places and also exponentiation
- The capability to easily enter numbers in Decimal, Octal, or Hex!
- The standard math functions of Pi, square root, rounding off, reciprocals, etc.
- Algebraic functions including factorials, modulos, logarithm's
- Sine, Cosine, Tangent functions, and the Arc's of each
- Statistical functions with slope, mean functions, standard deviation, and much more including linear regression
- Financial applications with 14 different functions

The Calculator is available on diskette only, for $29.95 and requires 24K of RAM. □

Tools.

Programming a computer is a combination of intellectual excitement and plain old drudgery. Good software tools can help relieve some of that drudgery. Here are six of the most useful "utilities" that we've developed to help us in our own programming work.

RENUMBER After you've worked on a Basic program for a while, the line number gremlin starts to harass you. You need to insert three lines of code, right after line 100. But there is already a line 101... RENUMBER is the answer! It will completely and reliably renumber your program, with the new line numbers starting with whatever beginning number you specify, and with the increment between lines that you select.

XREF When your Basic programs get to be a certain size, it can be very difficult to keep track of what variables you used where. It's also easy to lose sight of the "flow of control", i.e. where are all the places that I did a GOSUB to line 5000? XREF provides a complete cross reference of your programs. It gives you a sorted list of all variables with the line numbers where they occur. It will also provide a list of all references to line numbers, such as GOSUB and GOTO, as well as the location of all numeric constants.

LISTER Want to be able to produce pretty listings of your Basic programs? LISTER will do it for you! It knows about all those weird graphic characters and cursor controls that the Atari has. And is translates them into the standard "human readable" notation that we use in our program listings in the IRIDIS tutorial series.

LITFIX You can shrink your Basic programs by using LITFIX to replace numeric constants with variables. As you probably know, each numeric constant takes up seven bytes in your program. But each occurence of a variable name only takes one byte, plus the "one-time" overhead of its entry in the symbol table. LITFIX knows the rules, and only replaces constants when they occur enough times that replacing them with a variable will save space. You'll be pleasantly surprised at the amount of space that LITFIX saves.

CHANGER Do you want to replace "HEXIDECIMAL" with "HEX" wherever it occurs in your program? CHANGER lets you edit Atari Basic programs of any size by replacing one character string with another. You have complete control, and can interactively decide whether to allow each replacement of text.

BASCOM You have two versions of your favorite 2000 line Basic program. They are different, but you don't remember where or how they differ. BASCOM can help you, by showing you each place that the two programs are different.

Reduce your programming drudgery: order our **ATARI UTILITY DISK** today! This excellent set of software tools is only $24.95. Requires Atari 810 disk and 24K memory. A printer is required to use LISTER, and is extremely useful with the XREF program.

Order code: 653 Price: $24.95 in the US and Canada. California residents add 6 percent tax. Visa and mastercharge welcome.

THE CODE WORKS

Box 550
Goleta, CA 93116
805/683-1585

Software Review: Mind Bogglers-I

Versa Computing, Inc.
887 Conestoga Circle
Newbury Park, CA 91320
16K Cassette $15.95 - 24K Disk $19.95

Mind Bogglers-I consists of three game programs; Simon Says, Mystery Box and Capture. Simon Says is similar to the Milton Bradley game "Simon", where the player attempts to mimic a sequence of numbers (1-4) and sounds which are displayed in a horizontal position on the screen. Prior to the start of the game, you are given the choice of three skill levels, Easy, Average, or Hard. The more difficult the level, the faster the speed of the computers pattern. The game consists of five (single player) rounds with the score being cumulative from round to round.

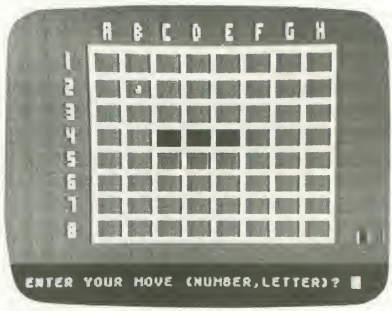
I've seen three "Simon-type" games thus far for the Atari. Simon Says seems to be a rather primative type of computer game, reminiscent of the game programs available in the early days of micros. With the capabilities available from the Atari, these type of game programs are about as attractive as a black and white monitor.

Mystery Box is a fairly interesting game in which the player must try and guess the position of randomly placed atoms (points), by shooting imaginary rays into an eight by eight grid in as few moves as possible. The outside grid locations are numbered from one to thirty-two.

Before starting the game, you must select the number of atoms you would like hidden in the box/grid. You must then choose the location at which you would like to inject a ray, by selecting a number from around the grid perimeter. The course the ray takes will help you in determining the locations of the atoms. An injected ray will never pass next to an atom, instead, it will be deflected sideways prior to passing an atom. If a ray collides with an atom, it is absorbed and if a ray exits at the same point at which it entered or is unable to enter the board, then it will be reflected. (After Mystery Box has been played a few times, it gets less confusing and more enjoyable.) Once the player feels as though he or she has guessed the locations of the atoms, and have entered the positions on the screen, then hit return. The computer will then determine just how good a detective you were. As mentioned earlier, in order to get the most enjoyment out of Mystery Box, I found that you should play the game a few times before passing judgement. Mystery Box is both fun and frustrating.

I've saved the best for last. Capture makes the Mind Bogglers package worth every penny. Actually, Capture is an Othello game written (very nicely) for the Atari. The first thing that impressed me with this game program, was the number of available options; player vs computer, player vs player, and computer vs computer (a very nice feature, especially when you are unfamiliar with the game, or are demonstrating the rules to an opponent). You are also given the choice of what color you would like to be (orange or blue), and if that wasn't enough, you can also choose who will go first, and at what skill level you would like to play (1-3). I always enjoy seeing options and/or skill levels on game programs like this. They help make the programs more challenging and less monotonous game after game.

I have never had the chance to familiarize myself with Othello. Capture was my first encounter with this type of game. The object of the game, is to try and finish with most, if not all, of the squares on the board in your color. The board is an eight by eight grid which is numbered from one to eight vertically, and A through H horizontally. The game starts with two blue and two orange squares located in the center of the grid. In order to capture your opponents square(s), you must place your colored squares(s) on both sides. This will change the surrounded opponents square(s) to your color. This can be done horizontally, vertically or diagonally. There is also an orange and blue bar graph on the right side of the screen that, in a glance, will show you who has the largest amount of squares on the grid. I have found myself becoming addicted to Capture, a very nice game for both player vs player, and player vs computer.



Strategy and thinking games have never been favorites of mine, and personally Simon Says and Mystery Box haven't done anything to change my mind. However, Capture is a different story. I would have purchased Mind Bogglers I from Versa Computing for the Capture program alone. For the price, it's almost like getting three programs for the price of one! □

Atari Printer Reviews...

THE ATARI 825 80 COLUMN PRINTER

Based on the Centronics 737 quality dot matrix printer, the ATARI 825 is a very impressive device. Ideally suited to word-processing, business use, or a high-quality printer in the home, the 825 can produce three character sets and then an expanded version of each, for a total of six different types of characters. In the home it makes an ideal replacement for the typewriter, especially when combined with a word-processing system. The paper feed is both tractor and friction allowing you to use nearly any type of paper with precise control over your printing requirements.

Simple commands control the printing font (style of characters), whether or not you want underlining, and the foreward or reverse motion of the paper. An 'escape, escape, control Q' for example will print the 'SECONDARY CHARACTER SET'. You can easily combine two or more sets of characters on one line with one exception, and when you specify underlining, it is done the same time as the characters above it, not after.

The printhead distance from the paper can be adjusted by just flipping a lever, allowing you to print on thicker surfaces such as several carbon sheets or mailing labels. Paper can be sheet fed individually, fan-fold type, or on a roll. The paper rack on the back handles roll or glides fan-fold over it. Any of these can be pin fed or the friction rollers can handle at the top of a page, go to the bottom of that page, then return to the top again to print something next to the heading, and the printing will not be offset in any way.

Switches on the front of the 825 allow you to select from On-Line and Local permitting to manually advance or reverse the paper by using this in conjunction with the REV/FOR switch next to it. On the right is the on/off switch; the 825 cannot be on the same time as the 822 or 820; only one printer may be on at any given time or printout may not occur.

The high impact plastic cabinet of the 825 houses a micro-processor driven dot matrix driver with a continuous 'mobius' type ribbon, which at first look appears rather a strange setup. The ribbon is sort of bunched in a tray rather than spool driven giving the printer fewer parts to breakdown. The ribbon never need reverse direction; it rotates 180 degrees after the printhead and before if reaches the ribbon tray. So the next time it passes before the printhead the opposite side is used until it goes through a third time and it is flipped again. The 825 is a non-graphics printer, however there are rumors of a graphic chip allowing 825 owners to upgrade their printer to graphics capability. This and the rumored Screen Dump-er from ATARI should prove to be quite impressive (lets hope this isn't just a rumor). The 825 lists for $999.95 and includes the cable that attaches to the parallel port on the 850 interface module, and a 59 page user manual. □

THE ATARI 820 40 COLUMN PRINTER

The ATARI 820 printer is a reliable, 40 column, dot matrix impact printer, capable of upper and lower case characters at a rate of 40 per second. In actuality, the 820's printer mechanism is from the Eaton 7000+ dot matrix printer. One thing which I found interesting is the fact that the 820 has virtually the same electronics as Atari's VCS. The same processor and PIA, with the PIA running the printer head instead of a television set. The main difference between the 820's electronics and the VCS board is the different ROM and the extra circuitry in the 820 to drive the printer head.

Before reviewing the 820, I wanted to put it through a very grueling workout. First, we decided to use the 820 for most of the long program listings in our last issue. However, the 820 printer comes standard with a blue ribbon (the type many grocery stores use in their registers) which doesn't reproduce well when reprinted or photocopied. Atari uses a 5/16 inch ribbon and recommends an Addressograph/Multigraph part number for replacement. Finding a 5/16 black ribbon was no easy task. I did however find a 5/16 ribbon which had to be transferred to the spool on the 820 (a messy job).

During the first month of use, I managed to use the

roll of paper supplied with the printer, and except for the need of an occasional drop of oil on the print head guide shaft, the 820 performed flawlessly. The standard 3 7/8 inch roll paper was much easier to find than the ribbon, and is readily available at most office supply or stationary stores. My only complaints during the first month of use was the noise (common with most dot matrix printers) and the automatic timeout cycle, which halts the printing for approximately three seconds to prevent overheating of the printer head. This pause occurs if the printer has been operating for long periods, and if taken into account, this pause changes the actual 40 cps speed of the 820.

I didn't feel as though this test proved the reliability or dependability of the 820, so we decided to use it on something a little more demanding. The mailing labels! Everyone thought that I was a little crazy when I decided to use the 820 for the labels but if this didn't burn the little sucker out, what would? I realize that the 820 wasn't made to be used with labels, but with 3½ x 16/16 labels and a watchful eye I printed 90% of the labels used on our premiere issue. Surprisingly, it handled the task with very little problem.

Overall, if the noise or speed aren't a determining factor in your choice of printers, and you need a virtually trouble free 40 column printer, than the Atari 820 should fit your needs. The 820 lists for $449.95 and includes all necessary cables and user manual.□

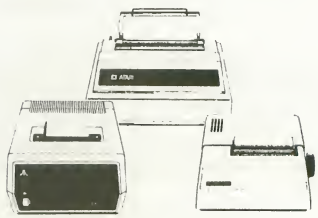
THE ATARI 822 THERMAL PRINTER

The first hardcopy device on my 800 was a Trendcom 100 thermal printer on which the ATARI 822 is based. Orginally I had it output through a Macrotronics printer interface which includes a small subroutine I added onto Dos 1, so every time I booted up the 810 Disk Drive with DOS 1, the printer driver went in also. The small routine is required to redirect the 'P:' commands through the number 3 & 4 front controller ports rather than the serial port on the 800's right side. This worked fine until I needed some sort of printout when using Compuserve. DOS 1 won't work with the Telelink 1 cartridge, so I couldn't use the Macrotronics interface system with the telecommunications setup. So I wired up the Trendcom to the parallel port on the 850 interface module, which needed some coercing to work properly. With help from Trendcom this was quickly solved using a .01 ceramic capaciter on the STROBE line in order to retime the signal (I would get double characters without the retiming: HELLO looked like this on the 100: HHEEELLOO).

When the 822 became available, the top on my 810 disk drive occupied by the Trendcom now became the resting place for the 822. When I first looked inside the 822, I thought 'Oh no!, it's missing half the parts, look at all the empty room compared to my Trendcom!'. I don't know how they did it, but the serial driven 822 has much fewer parts than the parallel 100. The printer is so quiet all you hear is the advancement of the paper. The 822 doesn't use ink of any sort, rather its' printing head consists of a heat-producing 'filament' about 3(8 inches square. The special heat sensitive paper darkens to the appearance of blue or black ink depending on which paper you use, and since no ink is used, the lettering won't smudge.

The 822 is about the same size as the 410 recorder, and houses the thermal paper role inside the heavily constructed metal and plastic 2.5 inch high casing. Some of the nice features include the ability to see what's being printed almost immediatly, unlike the 820 where the printing takes place deep inside the unit. The printhead is also bi-directional (it prints left-to-right, and then right-to-left if there are characters on the next line. The appearance of the print quality resembles that of a dot-matrix (like the 820), with a limit of 40 characters per line. The back panel has a 'clean' look to it, with provisions for the standard ATARI power block connector, on/off switch, and two ATARI serial connectors allowing you to daisy-chain your peripherals. When you take all this into consideration, plus the ability of the 822 to print graphics, it becomes the nicest all-around printer for the average home computer owner. The printer won't output the control graphic characters, but will do graphic plotting.

For the $449.95 price, I feel the printer is a prime choice for many users who require smooth, quiet, and reliable hardcopy. □



MACHINE LANGUAGE TO BASIC CONVERSION

by Paul Hoffman
President: BOSTON ATARI USERS GROUP

When ATARI designed the Assembler/Editor cartridge, they did not include a convenient method of converting assembly language subroutines into BASIC subroutines. The documented procedure, using string manipulation, is complex, and it makes the BASIC subroutine unreadable. If you sell your software, you might want to allow your customer to change the subroutines; this is very cumbersome with ATARI's "execute the string" construct.

The following program reads an area of memory, and writes the contents to the screen as DATA statements (with 20 bytes per statement). To enter these into your BASIC program, simply hit RETURN's over the statements, and save them on disk or tape. Before saving the DATA statements, you can remember them to fit into your program at the correct place if you wish. You can, of course, change lines 100 and 200 to set the correct beginning and increment.

To use the following program, write your assembly language program, assemble it, and save the object file on disk or tape. Replace the Assembler cartridge, and load your program into an unused part of memory; such as page 6 (it does not have to be the place where you will eventually load it in your BASIC program.) Run the memory reader program, and tell it where to start and stop reading; it will display the DATA lines on the screen. You can usually fit about 150 bytes on the screen at once.

The program uses the screen to allow you to convert machine language code into somewhat understandable basic POKEs. When it's running, it clears itself out of memory, so that all you have is your data. I feel that a utility such as this, which is much less cumbersome than the one suggested in the Assembler/Editor manual, should have been included in the original cartridge, but ATARI sometimes forgets little conveniences such as this... □

```
10 REM MEMORY READER BY PAUL HOFFMAN
20 REM DISPLAYS MEMORY ON SCREEN AS
30 REM DATA STATEMENTS
40 PRINT "Page, byte to start dump ";:
INPUT PSTART,BSTART
50 DSTART=256*PSTART+BSTART
60 PRINT "Page, byte to end dump ";:IN
PUT PEND,BEND
70 DEND=256*PEND+BEND
80 REM CLEAR THE SCREEN
90 PRINT CHR$(125);:PRINT :PRINT
100 DLINENO=10000
110 FOR RDBYTE=DSTART TO DEND STEP 20
120 PRINT DLINENO;" DATA ";
130 FOR DLOOP=0 TO 19
140 IF RDBYTE+DLOOP>DEND THEN 220
150 TEMP=PEEK(RDBYTE+DLOOP)
160 PRINT TEMP;",";
170 NEXT LOOP
180 REM DELETE THE LAST COMMA
190 PRINT CHR$(30);" "
200 DLINENO=DLINENO+10
210 NEXT RDBYTE
220 PRINT CHR$(30);" ":POP
230 POKE 84,0:POKE 85,0
240 NEW
```

SAMPLE PRINT MODES FOR ATARI 825™ PRINTER

PRIMARY CHARACTER SET SECONDARY CHARACTER SET

ELONGATED CONDENSED CONDENSED CHARACTER SET

ELONGATED SECONDARY

ELONGATED PRIMARY

UNDERLINED

SAMPLE PRINT FROM ATARI 820 PRINTER

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

!"#$%&'@( )<>=-|_*+^\/.,□

822

SAMPLE PRINTOUT

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
-=;+*,./_|^\:□?
0123456789
!#$%&'@( )<>

Assembler/Editor..... A NON-TUTORIAL

By Charles Bachand

One of the editors called me, quite unexpectedly the other day. "Hi, this is Lee", he said. "I just came up with a great idea for an article that you can write for the next issue. How 'bout a tutorial on the new Assembler/Editor cartridge?" Now, I hate to even read tutorial articles, let alone write them, but I kept listening anyway. "Oh, and by the way", he said as he baited his trap, "when the article is finished, I will let you borrow my video tape copy of FLASH GORDON!" That did it. I had to turn out some kind of tutorial article. Even though I hate tutorials, I was being forced to submit one for publication. After all, how long could it possibly take to write one little tutorial? It shouldn't take more than five or six double spaced sheets of paper, maybe a week to ten days at the most. "When do you need this finished?", I asked, not expecting the answer that followed. "I need this article by Friday", was his reply. He couldn't mean this Friday? This Friday was only three days away. "That's this Friday", he reiterated. My worst fears about Lee's mental stability had been confermed. He had lost his mind!

Since I missed "FLASH GORDON" when it was playing at the theater, giving Lee the benefit of the doubt seemed the safest thing to do. After all, a person writing a tutorial has three choices. He can write a tutorial, or he can write about something else and call it a tutorial (hoping that a certain person, in his crazed state will not notice), or he can do a little of both, like I am doing. I just don't want to bore myself when I have to read this later, checking the spelling, etc.

This is a good time as any to put in a word about writing articles for A.N.A.L.O.G. magazine. We need you to share your ideas with the rest of us ATARI owners. People are always complaining that they can just type into their computers. It is really your own fault. Half the enjoyment of writing a "game" program, for example, is knowing that other people are enjoying your work right along with you. And when it is printed in a magazine, thousands can join in the fun too. Now I do have a selfish reason for telling you all this. The more people who write articles and submit programs, the less I have to do, and I can get down to the business of writing terrific game programs.

The Assembler/Editor cartridge which was released only a few months ago, is a much needed accessory, useful by those who are serious about writing compact and efficient programs. It was a long time in coming, since the cartridge was ready almost a year before the documentation. ATARI decided to wait until the manual was ready before releasing the ROM. The people who created this program managed to get a lot of features in the 8K memory space they had to work with. There are three separate sections ot the Assembler/Editor.

The Editor, is an enhanced version of the screen editor built into the ATARI personality module. Besides the regular edit features of the cursor positioning and character-line insertion and deletion, it also contains commands to renumber lines (the line numbering increments at a specified interval), so if the line numbers originally were 10, 12, 13, 22, then typing REN would produce line numbers of the sequence 10, 20, 30, 40. Besides deleting a line by typing it's line number, you can now delete a group of lines in a program by typing DEL XX, YY. If you want to erase all the lines in a program between 300 and 450 inclusive, all you would have to do is DEL 300, 450.

Did you ever get bored of typing the line numbers of the program in, especially when they are set up in a numerical sequence? Did you ever wish that the machine could do it for you? Well, get out your whistles and party hats, the Assembler/Editor can do it all for you! After you type in the stement NUM, the editor will come up with the line numbers after every return you type in. You enter the statements. The computer does the rest. Oh, I wish that a few of these features had been implemented in ATARI BASIC.

We now come to the two string type commands that someone was thoughtful enough to include in the editor. The first is FIND. This command is used to find a specified string in a program. For example, let's say we want to find the string "START". Just type in 'FIND/START/,' and the first occurence of this string will be listed. More than likely, you want to list all occurances of the string that you are looking for. Just append an 'A', to the command so that it becomes 'FIND/START/,A' and the machine will list all the lines which contain the string "START" to the screen. You can even specify line delimiters, listing all lines between line X and line Y that have the string. During all of this, I have been using the chracter "/" as a delimiter. In reality, any character except a space, tab, and return can be used. And if the string you are searching for contains the character "/", you will have to use something else. FIND./2.,A is legal. Here "." was used instead of "/", because the string contained a "/". FIND?/2?,A is also legal. It sure beats looking through a 500 line program listing for a few spelling errors.

What if, after finding all the occurances of string "/2", you realize that you have made a mistake. You want them all to be "/4" instead. You can either go through every line that contains the string, or you can let the computer do it for us. This brings us to the last edit feature that I find note worthy. That is the command REP. To replace all occurances of string "/2" with "/4" all we have to type is REP./2./4.,A and presto chango, it is done. This time I used the period "." as a delimiter, as long as the character used is not in the strings. If the "/,A" was left off the end, only the first occurance of "/2" would have changed. You can even specify a line number range in which to replace, like the command "FIND". But what if you do not want to replace every occurance? If you tack an ",Q" on the end of the command instead of an ",A", the computer will list the line with the string and prompt you with a question "?". If you type a "Y" followed by a return, the string will be changed. If you just type a return, the string will be left intact.

To do I/O (Input/Output) to the editor, you have three statements that may be used. Loading a program into the computer is the function of the command "ENTER". You type the word ENTER followed by the pound sign "#", and the device to load from. Entering a program from the cassette is "ENTER#C:". From a disk file, you could use "ENTER#D:YIPPIE".

Saving a program is done with a variation of the "LIST" command. Normally the LIST command is used to list a program on the screen, "LIST", or on a printer. "LIST#P:". In order to save a program on the cassette recorder, we LIST it to device C:; LIST#C:. To save it on a disk file, one types "LIST#D:YIPPIE". The cartridge does have the commands "LOAD" and "SAVE" but these are used in the storage of binary load files only.

A variation on LIST is the command PRINT. PRINT does the same thing as LIST except it drops the line numbers in the process. I have not found much use for this command yet, except in one instance. One day while generating a data file of strings (yes folks, this cartridge does not check for syntax errors like BASIC does, because it does not store programs in a tokenized form). I had typed in the lines with line numbers so that the editor would not accept them as commands. After all the editing was done and the line numbers were no longer needed, I was going to write a BASIC program to read them in, and write them back out, minus the line numbers. Lee, however, came up with a great idea. "Why not do a PRINT to the disk drive with the data, then you don't have to write a conversion program", he said. You know, there may be hope for him yet.

Now, how would you like to use the added editing features on your BASIC programs. That is right! You can delete groups of lines, replace character strings, and enter lines with automatic line numbers. How do you do all this to your BASIC programs, you ask? First, after powering up with BASIC and loading your program, you LIST it to your storage device, be it cassette "C:" or disk "D:YIPPIE". Then you remove the BASIC cartridge and insert the Assembler/Editor cartridge. As ENTER from your cassette or disk is performed, and voila, you can now work on your BASIC program with a much superior editor. To go back, we simply LIST the program to the storage device, swap back to BASIC, and perform ENTER from the device in BASIC. Now, it is just a simple matter of resaving programs, and you are done.

In this issue, I have discussed only the features of the Editor. In the next issue the Assembler will be covered, which allows you to produce machine language programs. And the Debugger, which allows you to examine memory locations, trace program execution, disassemble machine code, and many other things. This cartridge is well worth having, and like I said before, a long time in coming. □

So you don't think I read articles before they go in Charlie??? Well next issue, you had better get me that assembly language tutorial, or no borrowing any more science fiction video tapes! —Lee

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BUGS & BYTES...

ASSEMBLER MANUAL ERROR

The Assembler Manual, on page 65, directs the user to CLOAD object code from the tape. It is not possible to CLOAD object code. Instead, you must use the following routine to load your object code:

```
100 TRAP 260
110 OPEN #3,4,0,"C:"
120 GET #3,X
130 GET #3,X
140 GET #3,X
150 GET #3,Y
160 ADSTART=256*Y+X
170 GET #3,X
180 GET #3,Y
190 ADEND=256*Y+X
200 ADCUR=ADSTART
210 GET #3,X
220 POKE ADCUR,X
230 ADCUR=ADCUR+1
240 IF ADCUR<=ADEND THEN GOTO 210
250 GOTO 120
260 CLOSE #3
270 END
```

OH NO! TWO FILES WITH SAME NAME!

So what do you do now? DOS doesn't say you already have a file by that name, and instead of writing over the first with the same name, you now have two files on a disk with the same name! Delete one and they both go. Change the name on one and they both get new names. To remedy this is a little tricky. Pay attention! First, turn up the volume on your TV set, then use the DOS 'E' command to change a file name. Listen carefully to the sound from the TV speaker; you can hear the first file name being changed, then the second (you only have to do this once, this first time is just a test so you can listen for the point at which the first name is changed and the second is about to.) Now do this again, but this time as soon the first name has been changed, hit 'SYSTEM RESET'. Then go back to DOS and see if one of the names has been changed. If your timing was off, and both names were changed, or maybe neither, than just try again. Don't worry, you can't wipe out a file doing this.

You can tell when the first name has been changed when a different 'beep' is produced. Also make sure both files are unlocked! □

MAZE RIDER

We received the following addition to last issues Maze Rider program from Phil Mork. It allows for a faster screen update:

```
0 REM *** ADD THE FOLLOWING TO THE MAZE
RIDER PROGRAM FROM ISSUE #1.....
20 TOP=PEEK(106):SWITCH=0
600 PI=0:GRAPHICS 6:SETCOLOR 1,0,14:POKE
 752,1:PRINT :PRINT "      YOU'RE LOOKIN
G";A$
1050 GOSUB 10000:GOSUB 600:POKE 77,0
1055 IF STICK(0)<13 THEN 1055
2015 POKE 106,TOP
10000 POKE 54286,0:SWITCH=16-SWITCH:POKE
 106,TOP-SWITCH:RETURN
```

The following fun and useful programs were sent to us by Bill Wilkinson of OPTIMIZED SYSTEMS SOFTWARE.

Some Funnies With Data Statements:

1. Try this...

```
10 DIM A$(20):RESTORE 32767:READ A$:PRINT A$
20 RESTORE 40:READ A$:PRINT A$
30 READ A$:PRINT A$
40 DATA LINE 40 DATA RUN:DATA DIRECT DATA
```

The trick: A DATA statement in a direct line is equivalent to a DATA statement at line 32768. Probably not very useful, but fun. Addressable data (RESTORE lineno) is fun and very useful.

2. Try this...

```
10 DIM A$(20)
20 TRAP 40:READ A:PRINT "NUMERIC,VALUE IS";A
30 GOTO 20
40 READ A$:PRINT "STRING: ";A$
50 GOTO 20
100 DATA 1,HI THERE,2,3,AAA,BBB,9,LAST ONE
```

The trick: If you get a read error, the DATA pointer does not advance — so you can try again! Remember: triggering an error (e.g., OUT OF DATA), the program stops on that error. Obviously, line 40 could have had its own TRAP if desired.

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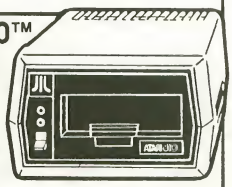

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* These are scheduled for release in the first quarter of 1981.

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IN THE SPOTLIGHT

ADVENTURE INTERNATIONAL
BOX 3435
Longwood, Fla. 32750

One of the first software companies to support the ATARI, Adventure International has an assorted array of programs, all in the game field. I have yet to see anything worthless put out by AI; I have played all of their offerings and found them bug-free and entertaining.

"Mountain Shoot" by Jeff Jesse and "STAR-TREK 3.5" by Lance Micklus (adpated for the ATARI by Dave Simmons) were reviewed last issue, and as you know, both evaluated as being well done and making use of the ATARI's graphics and capabilities. "STARTREK 3.5" was rated the best of the four other Star Trek games we compared it against.

"Angle Worms" is a two player game on the order of the 'surround' or 'blocked' type games, where you have to stay alive while trying to trap your opponent with a 'wall' that is produced from the tail end of your moving 'worm'. The game has some additional features as well. The playfield contains barriers randomly placed at the game's onset that you must negotiate. You also have the ability to shoot away your tail if it gets in your way — but you have a limit on how many times you can do this. On the same cassette or disk is "Crolon Diversion", a space game where you control a vertically moving ship that must intercept 'Crolon' fighters. Your ship moves slowly, up, then reaching the top of the screen, down, then up again, all at a set speed. You control the horizontal direction of the ship, and hit the joystick button when you are just about to come in contact with an enemy ship. This is an elementary game, but I found it very addictive indeed! Both "Angle Worms" and "Crolon Diversion" come as a package for $9.95.

"Deflection" is an easy game to learn, but difficult in which to become proficient. You have a moving ball (a Control T graphics character) that you maneuver about the screen using only the slash (/) key. You must intercept targets in the fewest possible 'bounces'. The sound effects and ability to remember high scores make this an interesting game to play. This retails for $9.95 also.

"Sunday Golf" by Jerry White may be the next best thing to the sport itself! You must negotiate randomly set up courses and choose from any one of three clubs: several irons and woods, and a putting iron. You input through the keyboard the direction you want the ball to go. This will never be precise all the time as 'wind' and varying surfaces will affect the ball's course accordingly. When you get on the green, the screen goes to a close-up side view of the putting green with contours and flag. This is a multi-player game and the best version of golf I have seen yet for home use. This lists for $9.95.

And of course, due for release are ALL the Scott Adams adventures, adapted for the ATARI. While most are simpler in terms of complexity than other adventure games, they have the reputation of being very tough to 'crack'. These should be as popular for the ATARI as they are the Apple and TRS-80. Other games are in the works and Adventure International intends to keep up their support for the ATARI as they have thus far. □

This column is intended to single out those companies whose products we feel are worthy of being run on the ATARI computers. They must be error-free, make use of the ATARI's graphics and sound capabilities, and have value as either good entertainment or personal usefulness. 'In The Spotlight' is not an advertisement nor are its contents affected in any way by the companies mentioned within. —The Editors

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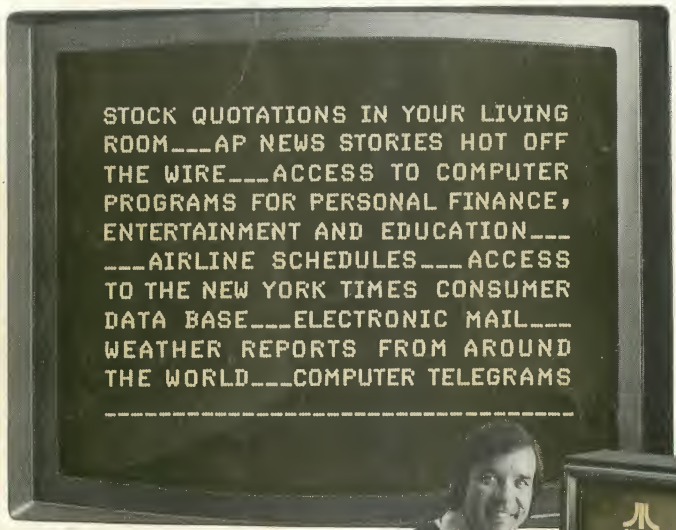

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